THE GUIDE TO

PRACTICAL PHOTOGRAPHY

John Wasley

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'In *The Guide to Practical Photography* John Wasley sets out to provide an easily comprehensive yet thorough guide to the mechanics of taking photographs. Although the book is designed for the amateur sharp-shooter, students will find its matter-of-fact approach and freedom of jargon stimulating, and the text is illustrated with some apposite examples of what Mr Wasley is talking about.'
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The Guide to Practical Photography

JOHN WASLEY

SPHERE BOOKS LIMITED
30/32 Gray's Inn Road, London WC1X 8JL

First published in Great Britain by Pelham Books Ltd 1973
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Sphere Books edition published 1976

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Printed in Great Britain by
Hazell Watson & Viney Ltd
Aylesbury, Bucks

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Prologue

So you have decided you want to be a better photographer. You have made a wise decision. Progress is vital in whatever you do, otherwise you stagnate. Photography, the medium of our times, is no exception.

If you are still in doubt about whether you should get involved, think about the reaction of your guests the last time you suggested showing them your album or projecting your latest slides. In fact, some of your friends may have stopped coming around already. They are tired of seeing the same old static shots of your wife standing in front of the Eiffel Tower while on holiday this year, and comparing it with your wife standing in front of the Taj Mahal while on holiday last year.

We will analyse this situation later in the book, but suffice it to say now, such photographs are a crashing bore. Think about it carefully. Wouldn't you find it tedious in someone else's house?

More important than that, surely you want to produce pictures which will retain their lasting interest over the years to come. How many of last year's crop have you looked at recently and discarded in disgust. Even the best seemed to have lost their impact as enjoyable memories of the event dimmed.

That is the basic problem with snapshots. They only mean something to the people who participated – and then only for a short while afterwards. The trick is to somehow capture a lasting feeling of the occasion on film so that even a casual viewer can participate. That is what photography is all about.

With a little effort you can progress to the stage where your guests will be eager to see your latest masterpieces. All you have to do is follow a few simple steps. In fact, if you are keen

enough, your work will improve to such an extent that you will be able to sell for publication. Your costs will be recouped – capital as well as recurrent.

But right now, let's have a look at what you will be learning from this book. Whether you work in colour or black and white, you will be able to progress through each stage to make yourself a better, all-round photographer. You will learn the basic principles of making a photograph which has impact, and how to match the right film to the subject for optimum results. With practice, you will become an expert at anything from portraiture to action photography, or simply a competent holiday cameraman.

Tricks of any trade are useful for speeding up the learning process, and photography, too, has its short cuts. You will learn of these. As you begin to understand them, and put them into practice, you will gain confidence in yourself, and that alone is sufficient to improve your results.

If you are a keen do-it-yourself man (or woman) you can follow your original exposure through to completion. Processing and darkroom techniques are simplified and explained to enable you to get first-class results. How to find the best developer to use for any given film, how to expose in an enlarger, selecting the best enlarging paper and a host of other important facts are presented within these pages for a slick, trouble-free approach.

Each practical chapter can be treated as a separate entity. It is designed to stand on its own. You can even take them in any order to improve your camera craft, beginning with your favourite subject and then extending to others slowly, as you master each successive one. However, to get things into perspective, you will need to read the chapters on cameras and accessories and photographic theory first.

But whatever method you use to study this book, put your new-found techniques into practice on each step of the way. As you learn something, practise it. Work at it until the technique becomes a habit. You will be reminded of this in almost every practical chapter Repetitious though it may be, it is the key to your competence, and it must not be forgotten. Practice breeds knowledge, and knowledge breeds confidence. Be sure of this, confidence shows in your photography.

As you practise your techniques you will find yourself remembering more and more. Then, in an emergency, you will

know exactly what to do. There will be no hesitation. You will not have to think about the mechanical details, and all your actions will be automatic. Many shots you would have lost in the 'old days' will find their way into your album.

The idea is to make the camera a part of you. It should be an extension of your hand and eye.

One more thing before we get down to the 'nitty-gritty'. Always carry a camera. You can bet a glamour shot to an abstract that the time you haven't got your camera with you is when the most important event of the century unfolds itself before your very eyes. Yes, it will be maddening. You may even think of throwing yourself off the top of Kodak House.

So don't let it happen. Get into the habit of taking your camera wherever you go.

Right. Now let's get on with it. Your camera is in your hand and your feet are in the starting blocks. Get yourself well prepared for the 'off'. How does it go? On your marks!

Get set!

Turn the page!

CHAPTER ONE

Understanding the Hardware—Cameras

To be effective, a craftsman must be thoroughly conversant with his tools. As a cameraman, you must consider yourself a craftsman. Nothing less than an intimate working knowledge of your photographic equipment is necessary.

Do you think you can get by without this knowledge? It is impossible. Your work, at the very least, will be erratic and you cannot afford to lose even the odd picture – it may be the important one. Accept the fact now, and weigh the odds in your favour.

Even if you own a simple cartridge-load camera, you should still take the time to learn about it. Of course, if it has fixed focus and fixed everything else, there will not be too much to learn. But you would be surprised by the number of mistakes made by the owners of these modern versions of the box camera. They get too close, or they fit a flash cube and use it too far away. Some do not acquire the habit of taking the lens cap off before shooting. All because they thought they knew everything about the camera and didn't bother to read the instruction leaflet properly, if at all.

It cannot be stressed enough. Such knowledge is the key to good photography. Whatever type of camera you own, you must practise with it until you don't have to think about it any more. Establish a 'countdown' routine, just like an astronaut, by developing a mental check list of things you should do before taking the picture. That way you will become the master of your camera.

With this thorough knowledge of camera handling at your fingertips, so to speak, you can then concentrate on the important thing – the subject. Composition, direction and simply getting

things just right will be so much easier because they are all you need to concentrate on. As a result, you will gain more confidence and put people in front of the camera at ease by making them see that you are the expert. The unexpected will hold no fears for you. It will happen, and you will shoot – automatically and with speed.

How else do you think a sports photographer gets such exciting shots of the jockey falling from his mount at the water jump, or the crashing racing car? How else does the press photographer get the mid-air flight of the policeman's helmet dislodged by a demonstrator? If the actions of these cameramen weren't automatic and disciplined, they too would be struck immobile with shock on such occasions, like lesser mortals. They would still be fiddling with their cameras to get the settings right when the action had long gone.

The first step in gaining this essential know-how is to discover how your camera works. Your hobby will be much more exciting and rewarding when you understand the intricate working details of that little black box in your hands.

If it moves . . .

Actually, 'box' just about describes it. A light-tight box with a device fitted over a hole at one end to allow a controlled amount of light to enter when needed. The device is just like a door, in that it opens and shuts, but in this case, for a specific amount of time. It is known as the shutter.

When the shutter is open, the light reflected from the subject passes through the hole and onwards to a light sensitive strip of emulsion or film. The light exposes the film and the image is latently formed. All will finally and visibly be revealed during the processing stage.

In the early days of photography this shutter was little more than a lens cap. Films then were so insensitive that they took minutes to expose. The photographer bade his sitters remain absolutely still – at times even ensuring it by clamping their heads – removed the lens cap and counted off the minutes.

Things have improved since then. It now takes fractions of seconds only, and fast-moving objects can be 'frozen' on film for posterity.

There are three basic types of shutters in modern cameras.

Simple models have a single metal plate which is positioned right behind the lens. It has very few speeds, but within its limitations it is effective enough.

The more advanced cameras are fitted with one of two types – the leaf, or between the lens shutter, and the focal plane shutter. Constructed of a number of wafer-thin metal leaves overlapping each other, the leaf shutter is activated by a spring. It is extremely accurate and generally has a top speed of 1/500 sec. It is built into the lens barrel itself, positioned between the glass elements.

Focal plane shutters are situated in the camera body directly in front of the film. They are usually built into cameras which have the facility of interchangeable lenses, so that you do not have to buy a shutter with each new lens.

Apart from a variation recently introduced, these focal plane devices are normally made of treated canvas. They work just like a window blind, only horizontally. In the blind there is a variable slit which, when activated, moves across the film plane exposing the emulsion as it goes. The size or width of the slit depends on which shutter speed is being used. The slower the speed, the wider the slit.

The new type of focal plane shutter resembles a guillotine. It is constructed of metal and operated vertically, otherwise it performs similar to its cloth sister. Both of them are extremely accurate over the complete range of speeds, some even reaching an incredible 1/2,000 sec.

Settings on all modern cameras are identical and range over any or all of the following:
1 sec.; ½ sec.; ¼ sec.; ⅛ sec.; 1/15 sec.; 1/30 sec.; 1/60 sec.; 1/125 sec.; 1/250 sec.; 1/500 sec.; 1/1,000 sec.; 1/2,000 sec.

In addition, there is usually a setting marked 'B', meaning bulb. The name stems from the days when a rubber bulb was used to fire the shutter. It is now used for time exposures. Press the release button with the dial turned to 'B' and keep your finger on it, and the shutter will remain open until you let go.

On some cameras you will find another letter marked on the shutter speed dial. This one is the letter 'T', meaning Time. It is another device to let you take long exposures. When you press the button the shutter will open and stay that way, even if you take your finger off the button. To close the shutter, you

must press the button again. However, in most modern camera designs, 'T' has now disappeared.

How to get maximum use out of a shutter will be explained in later chapters, but a brief description now will give you a working knowledge. Basically, the faster the shutter, the faster the action you can 'freeze'. For example, if the shutter opens and closes in 1/500 sec., a running man will not have moved much in that time. The speed of the shutter will have captured a fragment of his action. His image will be literally petrified in mid-stride.

This does not mean that you should take every action shot at 1/500 sec. On the contrary, it would be impractical and monotonous. If the light level is low, for instance, it will be necessary to use a slower shutter speed to allow more light to reach the film.

But, extraneous factors aside, there are times when you will want a little movement to show. Consider the express train passing in front of you. It will look very exciting to the 'naked' eye. When frozen with a fast shutter speed however, it is just a hunk of mechanised steel. All sense of action will be destroyed. You might just as well have photographed it while standing in the station. The effect would have been the same. Modern diesel trains don't even betray movement with a stream of smoke.

What you need is a shutter speed fast enough to freeze the movement of the train, but slow enough to show some blur in the wheels.

Slower shutter speeds bring their problems too. For instance, unless you have an exceptionally steady hand, you should not attempt to take pictures using a shutter speed of less than 1/30 sec. You will have seen the results of some tries – blurred and indistinct images with fuzzy edges where they should be sharp, and people who appear to have more than one pair of eyes each.

You must steady your camera in some way when using slow speeds. A nearby wall or door jamb, or better still a tripod, will aid you in achieving sharpness in your photographs.

Light control

This business of altering the shutter speed to suit yourself and the movement of the subject poses something of a problem. If you cast your mind back you will recall that one of its functions is to

control the amount of light reaching the film. For instance, to take a photograph in low lighting conditions your film will require plenty of exposure. You will have to use a slow shutter speed. But, suppose the subject is moving too. What then? There has to be another control.

This additional control is called an aperture, or iris. In many cameras it is constructed just like the iris in your eye, and operates in the same way. When you look at a strong light, your eye iris closes to a small pin-point. Darkness produces the opposite reaction. That is exactly what happens in a camera. The only difference is, you have to decide on the size of the aperture. It does not work automatically in the same way as your eye, except in some electronic cameras.

All cameras have an aperture. On the simple models it may be little more than a hole in a piece of metal, or two holes of different sizes in a sliding device. A lever on the camera is operated to move either one of the two holes into position behind the lens, giving the photographer some control over the intensity of the light reaching the film.

However, the eye-type iris fitted in cameras is constructed of metal blades which are set around the inside of the lens mount. Like a leaf shutter, they slightly overlap each other. You control the iris by manipulating the aperture ring. As you rotate it, the iris either closes or opens.

You use this second control in conjunction with the shutter, freeing the latter to cope with subject movement. To explain. Like the shutter, the aperture is carefully measured and numbered to give consistency. It is opened or closed in measured stops. Were that not possible, your results would be erratic. These stops are known as f numbers, and most cameras have any or all of the following:

f1.2; f1.9; f2; f2.8; f3.5; f4; f5.6; f8, f11; f16; f22.

It is important to remember that the smaller numbers represent the larger apertures. For example, f2 8 is a larger aperture than f8, and so on.

Another important factor to bear in mind is that each stop allows double the intensity of light to pass, than that of its smaller neighbour. Take f8 as your starting point. Should you change to f11, its next door neighbour, you will halve the light intensity reaching the film. If, on the other hand, you decide to

use the aperture on the other side of f8, that is f4, the intensity will be doubled.

Now, in the cause of accuracy, manufacturers make the shutter and aperture perform identically. Each halves or doubles the light intensity as you move the ring from shutter speed to shutter speed, or from aperture stop to aperture stop. Accurate control then becomes easy.

Consider this hypothetical situation. You have been taking some general landscapes using the same aperture of f8 and a shutter speed of 1/60 sec. Suddenly faced with a fast-moving subject, you decide to alter the shutter speed to 1/125 sec. to make sure all movement is stopped. But, if you speed up the shutter only, the film will receive a reduced amount of light, as in this case where the light intensity has been cut by half. The result will be an underexposed negative.

You know what you have to do to make the exposure right, of course. You must adjust the aperture as well. But stop reading now and try to guess the answer. What should be the new aperture? Have you got it? Right. The answer is a one stop adjustment to the wider aperture of f5.6.

Depth of field

Now that you know how the aperture works in relation to the shutter speed, let us see the effect it has on focusing. You may think there is nothing more simple than to rotate the focusing ring until either the double image in the rangefinder merges into one, or the image becomes sharp and well defined in the viewfinder.

But that is only a part of the story. A significant fact which will greatly affect your future compositions is the amount which is sharp. You can see the results of this by studying a few of your photographs. Notice how in some, while the object of interest is sharp, areas behind and in front are fuzzy. The detail isn't sharp at all. The focus 'falls off'.

This sharp area is given the name of 'depth of field'. It is variable, and you, the photographer, can control it. You can make this sharp band wider or narrower, depending on the aperture you select. A wide aperture means a depth of field so narrow that your focusing has to be spot on. Smaller apertures produce the converse effect, until everything from the end of your nose to infinity will be in focus.

You can pre-select the area you want in focus too. All focusing cameras with a range of apertures have a depth of field scale. It is situated right next to the focusing ring.

Find your camera and check it now. If you are not sure about its location on the lens barrel, read your camera instruction book. You will see that the numbers on the depth of field scale correspond to the apertures – f2.8, f4 and so on. But, here the numbers are repeated each side of the centre point, starting with the widest aperture in the middle, and getting progressively smaller on each side. The mark between the two sets of numbers also doubles as the distance indicator.

To show you how it works, let us select an aperture arbitrarily – say f16. Now, focus on a nearby object and check the distance on the scale. It may be fifteen feet. Now you can see just how much you have in focus. Read off the distances indicated which are in relation to the two f16s on the depth of field scale. At the lower end of the scale, the f16 may be adjacent to the 10 ft. mark, and at the other, the 25 ft. mark. Now you know that anything in between 10 ft. and 25 ft. will be in focus.

If it is too much or too little you simply adjust your aperture (not forgetting to compensate by altering the shutter speed too) You can make the depth of field narrower by opening the iris one or more stops, and broader by closing the iris down. When you have fully practised the principle you will be able to use depth of field to your advantage.

Of course, if you have a single lens reflex camera you will be able to check the depth of field visually. Most of them are fitted with a pre-viewing button which enables you to stop down to the previously selected aperture and see just how much is in focus.

You will learn about the many ways depth of field will improve your photography in the chapters to come. But to put the principle in perspective, and to illustrate its importance, here are a few facts.

When you take a portrait, indoors or out, you will obviously want to subdue the distracting background as much as possible If it receives as much prominence as the figure, it tends to attract the eye away and make the entire picture a jumble of detail. A simple method of subduing anything in a picture is to 'throw' it out of focus. Use a wide aperture and the background in the

photograph will be soft focus. The face will stand out from the 'fuzzy' mass, producing a startling three-dimensional effect.

It is a fact that the closer you get to a subject, the more restricted becomes the depth of field. It narrows considerably. This phenomenon is even more pronounced when you use close-up attachments and they are at their most extended position. Then the depth of field is almost non-existent. In cases like this an overall increase in the depth of sharpness is necessary, otherwise even a small subject like a flower, when taken in close-up, will be sharp at one point, but nowhere else.

Oddly enough, if you have ever looked through a telephoto lens you will have noticed a similar occurrence. Depth of field is much more restricted in shots taken with long telephoto lenses than those shot at the equivalent apertures on lenses of a standard focal length. The longer the lens, the more pronounced the effect. In order to get reasonable 'in focus' areas, you have to select a smaller aperture on a telephoto than usual.

Hyperfocal bonus

There are times when even maximum depth of field is not enough and you need an extra bonus of sharpness. The technique to help you to get this is known as the hyperfocal distance. Don't be frightened by the complex-sounding title, the technique is quite easy to put into practice.

Take infinity as your focusing point. If you study the focusing ring and depth of field scale on your camera you will see that the infinity mark will be adjacent to the centre point of the scale. Because infinity is the last mark on the focusing ring, you will be only using half of the depth of field scale. Since everything beyond the infinity mark will be in focus anyway, there will be, in effect, an open-ended depth of field.

Now, hyperfocal distance will make maximum use of the scale. Assuming an aperture of f8, you know that under normal circumstances everything between one f8 and the other on the depth of field scale will be in focus. But in this example, you are using infinity, and one of the f8s will be facing a blank section of the focusing ring.

It is perfectly reasonable to assume that if you rotate the focusing ring to position the infinity mark adjacent to the poor, neglected f8, it will still be in focus. A quick check of the other

f8 will reveal an interesting change. Instead of the minimum distance in focus being say – 30 ft., it will be something like 15 ft. A substantial bonus.

In actual fact, you can use this technique at any focusing distance; you do not have to reserve it only for subjects which are 'infinity-distance' away. What happens when used nearer than infinity is that you place the subject at the rear of the area in focus, instead of somewhere in the middle.

These are just a few reasons for knowing about depth of field control. As your photography improves and you become more practised, you will discover a number of situations where absolute control is vital. Your skill will become so much a part of your camera work that you will wonder how you managed without it before. Practice, as the adage tells us, makes perfect. It is by practising repeatedly with the controls of your camera and studying the resultant effects, that your goal of a good standard of photography will be reached.

Camera Categories

Now that you appreciate the method of light control and focusing, it is time to have a look at the various types of cameras which are available. A book this size could not contain all there is to know about all cameras. Such information would need a definitive work of about ten volumes. So you must supplement what you read here with what you can learn from your own camera instruction book. The two together will help you to build up a considerable working knowledge of the camera which matters most to you – your own.

The range starts with the simple camera, of a very basic nature with very few controls, and ends with the highly sophisticated model which does practically everything except take the picture for you.

You get what you pay for, of course. The more expensive camera generally has more refinements. There will be a wider range of apertures and shutter speeds, or a built-in exposure meter, or interchangeable lenses, or, indeed, all of these advantages.

There are a number of different types of cameras in the photographic shops. They all have different features and the choice is even more complicated by the fact that, within these groups, they are divided again by different formats. There are those which take

120 film producing twelve negatives sized 2¼ in. by 2¼ in. (twenty-five on 220 film) or eight 2¼ in. by 3¼ in. Then there are 35 mm cameras. Their negatives are small by comparison – only 1 in. by 1½ in., or in 35 mm half frame, only 1 in. by ¾ in. However, on a 36-exposure standard 25 mm film you will be able to shoot 72 photographs with a half frame camera.

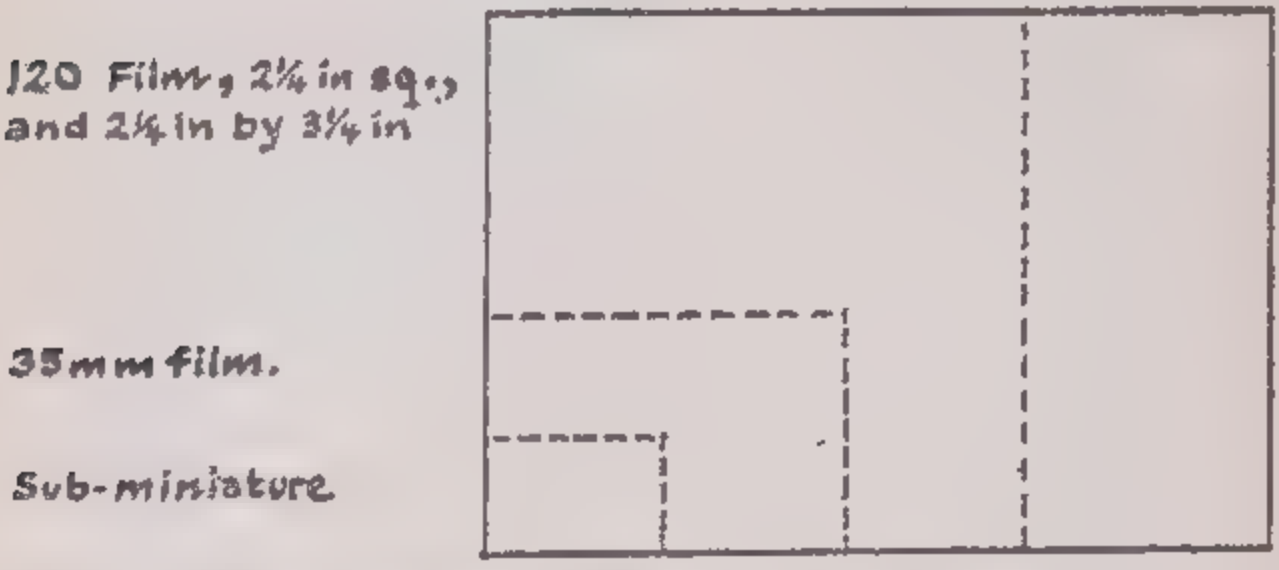


FIG. 1 Film sizes compared. 120 film, 2¼ in. square, and 2¼ x 3¼ in

Cartridge load cameras are the latest design innovation. Kodak first brought in the 126 camera and film system which had the effect of making photography easier, if not foolproof for the millions. To load, you simply drop a cartridge of film in the camera and close the back. With a couple of turns of the film advance lever, you are ready to shoot. The negative area is an ample 1 in. by 1 in. and each film allows you to shoot 12 pictures. The system, while originally designed for the simple range of cameras, has now been extended to some more sophisticated models as well, in an attempt to woo the advanced cameraman.

The latest extension of the cartridge load system takes it into sub-miniatureland. A range of pocket-sized cameras has been designed with the overall title of the '110 System'. They accept 16 mm film with a backing paper in cartridges which give 12 or 20 exposures of 13 mm by 17 mm.

Vest pocket cameras are not new, of course. You have seen them featured in countless spy sagas. But until now, the sub-miniature has been considered a highly specialised camera and

has not made great inroads into the amateur field. Film manufactured for these models produce anything up to 50 exposures with negatives of ½ in. by ¾ in.

However, your choice of format does not restrict you to one type of camera. Manufacturers have made sure that every camera taste is catered for, whatever your preference for film size. You can, of course go for the big boys, which take film sizes 5 in. by 4 in. and up. But they are more for the professional cameraman. You would do well to leave them alone for the time being. There are enough cameras around in the amateur range to keep you occupied for a long time to come.

The Viewfinder Camera

It derives its name from the optical viewfinder situated above the lens. There is sometimes a framing device within the finder. This

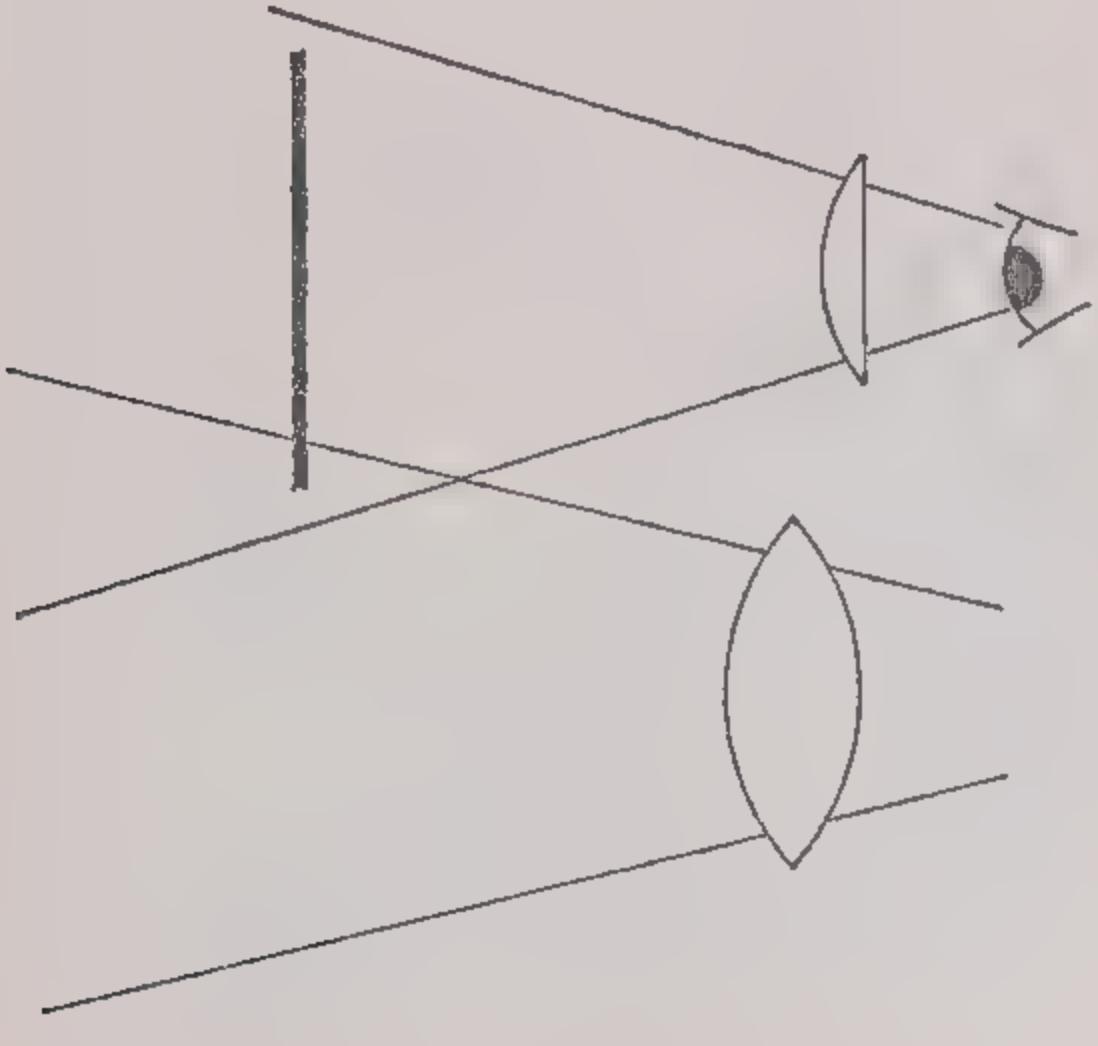


Fig. 2 Parallax

allows you to see not only what you are composing, but also a small surrounding area to ensure that you leave nothing out.

Most modern cameras of this type also have a range-finder built in. It is usually coupled to the focusing ring and operates in unison as the ring is rotated. Nearly all rangefinders are of the double image type which covers part or all of the viewfinder. When you reach the point of focus, the two images in the viewfinder become one.

The field of view seen through the eyepiece is identical to that seen by the lens, except when the camera is too close to the subject. It then suffers from what is called parallax. This is the difference in the field of view between the eyepiece and the lens at distances under five feet. You have probably seen the result – tops of people's heads cut off, and the like. (See Fig. 4.)

You can compensate for parallax simply by inclining the camera backwards. But this is rather a hit or miss method. The only consistent system for close-up work is to use a specifically devised accessory rangefinder which clips on to the front of the normal viewfinder window. It is, in reality, a prism which bends the angle of vision to correct the error.

A viewfinder camera may or may not have the facilities for interchanging lenses. If it does, when you use another focal length, you must fit a special adaptor to the viewfinder so that you see what the lens sees.

Finally, there are viewfinder cameras for every film size in the range already discussed. So, if this is the camera type for you, the choice of format is yours.

The Twin Lens Reflex

So called because it actually does have two lenses. The viewing lens is set above the taking lens. Cameras of this type are usually box shaped, and you view the subject through a ground glass screen set in the top of the camera. You have to look down at the image, using what is called a waist level viewfinder.

The light enters the viewing lens, and is then reflected up at right angles to the glass screen by a mirror. The image is the right way up, but it is laterally reversed. At first it takes a bit of getting used to, since you have to move the camera in the opposite direction to that indicated by a mobile subject pictured in the screen. However, after shooting with a twin lens reflex for a while you

will wonder how on earth the fellows with other types of cameras manage.

While the twin lens reflex is normally confined to the larger format 120 or 220 film, it functions in every respect like any other camera. Even focusing is trouble-free. Since the two lenses are mounted on the same unit, they both move in unison when you focus.

The TLR also has parallax effects with subjects too near the camera. But close-up lenses are available in pairs – the one for the viewing lens being the prism. All models with the exception of one have non-interchangeable lenses. If you want to extend the focal length for special work, then you will have to use supplementary lenses, or buy a camera made with lenses of the focal length you need.

It is possible to adapt one or two models for 35 mm use. A special gadget clips in the back, together with 35 mm spools. The 80 mm standard lens then becomes a medium telephoto for the 35 mm format, which normally has a standard lens of about 50 mm.

The Single Lens Reflex

This camera rocketed to popularity in recent years, largely in its 35 mm full and half frame formats. There are some 120/220 SLRs available, but they are generally categorised as cameras for the professional or advanced amateur – if only because of their prices!

It derives its name from the design which allows the viewer to see right through the taking lens. A system of mirrors and prisms produce a right way up, right way round image in the viewfinder. Light entering the lens is caught by the mirror and reflected up towards a prism. In the prism, the image bounces around until it arrives at the viewfinder screen in the right order.

It has the disadvantages of blacking out each time you take a picture. The mirror has to 'flip' up out of the way of the film to allow the light to pass. When it is at the zenith of its travel, the mirror prevents all light from reaching the viewfinder, and the screen goes black. It is a little disconcerting at first, but since most exposures are measured in hundredth's of seconds, and on most cameras the mirror returns to its normal position automatically following the exposure, vision is not lost for long. You soon

become accustomed to it, and after a while you will hardly notice.

The development of the SLR has led to a new kind of automated iris. This evolved as a result of the necessity of viewing the subject at full aperture. Trying to see through a stopped down aperture is almost impossible. The image is very dim and focusing is difficult, to say the least. This difficulty is increased in low lighting conditions. You can, of course, view and compose at full aperture, then stop down just before shooting, but it is so easy to forget the last, all important step in the heat of the moment. The end result? Grossly overexposed negatives.

Conscious of this problem, manufacturers developed a new invention. Called an automatic diaphragm, it first has to be primed by pre-selecting the required aperture. Visually, nothing happens. Then, when you press the shutter release button, the iris closes down to the pre-selected stop automatically. It must be emphasised that not all SLR cameras have this feature. If you deem it a must, check before you buy the model you have your eye on.

Another development in camera design because of this popular camera is the through-the-lens meter. You can now take exposures of exactly what the lens sees. The meter reads only what is in front of the lens, whatever the focal length. With this system it is possible to get much more consistency and control over exposure reading.

The SLR, of course, does not suffer from parallax, and you can also fit lenses of any focal length without having to buy supplementary viewfinders.

Inasmuch as most single lens reflex cameras have facilities for interchanging telephoto lenses with wide angle lenses, copying devices with close-up attachments, they become the very foundations of photographic systems which many cameramen find hard to resist.

The Sub-Miniature

The sub-miniature camera takes 16 mm film and fits snugly into your breast pocket. This is one of the reasons for its popularity. Photographers like the idea of not having to carry a large bag of equipment around with them.

Sometimes called the 'spy camera', it is frequently seen in action in the hands of people like Ian Fleming's James Bond, Len Deighton's Harry Palmer, and a host of other screen secret agents.

However it does have a legitimate place in the amateur photographic field. Ideal for candid work, its small size leaves you with no excuse to be caught without a camera.

It is almost exclusively of the rangefinder type, and functions just like its larger brothers. The controls are designed to make the operation simple, although they may be limited in range, in comparison.

Your Choice

Well, which one is for you? It is next to impossible to define the best type of camera. The ultimate decision tends to be a personal one and largely rests on a totally unreasonable concept – the appearance. Should you be in the unenviable position of searching for a more versatile camera, your best bet is to begin by studying the catalogues and magazines. First look for cameras in your price range, whittle them down to three or four which you like the best, then call in on your nearest photographic dealer.

Ask to see your chosen models. Handle them to see which one fits snugly in your hands and feels the most comfortable. When you have settled that, then you have your camera.

There is no real choice to be made between formats these days. It can rest entirely on preference. Naturally 120 films have an edge over sub-miniature when big enlargements have to be made. The image holds together better on photographs taken from the larger negative.

So, your choice must be based on which type of photography you want to do most. A twin lens reflex camera for instance, is ideal for portraiture. The square negative lends itself well to portrait composition, and for some obscure reason the sitter feels much more confident if he or she can see a bigger camera in evidence.

A rangefinder camera definitely handles well when shooting in low lighting conditions because there is no loss of image brightness in the optical viewfinder at all. Finally, the SLR has settled down to become a general purpose workhorse. It seems to be able to handle most things well, but is particularly suited to action photography.

The important thing to consider when making a camera choice, is to look to the future. As your experience grows, so will you desire to extend your photography in a variety of directions. If

you have a camera which restricts that growth, one day you will have to buy a more versatile model. An expense you can probably do without.

Keep the future in mind, even if the camera you buy has refinements you are not likely to use for a long time to come. When that moment does arrive, you will have the potential versatility at your fingertips already. Start now to build a camera system in step with your development as a photographer.

CHAPTER TWO

Understanding the Hardware—Accessories

The camera on its own is only the beginning of things It allows you to perform basic photography and even be creative to a certain extent. But your versatility will expand dramatically with the accessories and attachments you add.

Make no mistake, I am not advocating that you develop gadget mania. Everything you buy should have a purpose and should expand your horizons in measured amounts Don't buy for buying's sake.

The first accessories which will catch your attention will probably be lenses of different focal lengths, to either bring the subject closer to you, or to allow you to get more in. When you buy a camera, the lens already fitted is standard for the format – around 80 mm for 120/220, 50 mm for 35 mm cameras, full frame, 35 mm lenses for half frame and about 12 mm for sub-miniature. Anything longer than any one of these constitutes a telephoto lens, anything shorter, a wide angle lens.

On the other hand, you may be a close-up enthusiast. Close-up lenses are good all purpose attachments. They fit on any camera, whether the standard lens can be removed or not. If you have a camera with the facility for interchanging lenses, however, you might go for bellows or extension rings. Other accessories available are so numerous that it would be difficult to record them all here. You can turn your camera into a microscope, or a copying machine, and so on. The range is only limited by the camera you have and the depth of your pocket.

Let's take a look at some of the items in this wide range of hardware. Lenses are, of course, all-important to photography. The days of the pinhole camera are gone. The only way to get a

sharply defined picture is with a lens. But before delving too deeply into lens performance, it is necessary to understand something of the behaviour of light, so that you may appreciate not only how a lens works, but also the basic principles of image formation.

Light and Lenses

Light travels in straight lines. A fundamental statement, but a fact nevertheless. Were it not so, photography would be impossible. Conduct an experiment to prove the theory Switch on a flash light in a dark room. You will see the beam of light slicing through the darkness in a perfectly straight line.

As a development of this experiment you might care to construct a pinhole camera. Apart from learning a great deal, you will find it is fun to play with and to try to shoot pictures with it. The construction is easy enough. It is little more than a completely enclosed box, with a tiny hole in one side to admit light. The light passes through the hole and an upside down image forms on the opposite inside surface.

In order to see what is going on inside, you need to take it into a darkened room, where the only light is admitted through a keyhole. Then you can lift the top off the pinhole camera and with the hole pointing towards this small shaft of light watch the image form on the far surface. You can alter the size of the image by moving the box backwards or forwards.

When you take it further away the image becomes larger but the brightness fades. Bring it closer to the keyhole and the image grows brighter, but it shrinks in size. While the pinhole camera is interesting to experiment with, and has been used successfully in the past, the image is too weak for general practical work.

Increasing the size of the hole to admit more light is not the answer. When you do that, the image becomes less distinct in direct proportion to the size of the hole. Eventually you reach a stage where the hole is so large that a close inspection would reveal several images projected onto the surface, all overlapping one another.

It is the lens which makes the difference. It serves to collect all the light rays together and focus them on a single point. All those overlapping images become one. The problem is solved. The lens allows the camera to have a 'pin hole' for a manageable image

brightness while at the same time preventing more than one image forming.

Of course, the image still forms upside down. Nothing can change that. It happens because light travels in straight lines Light reflected from an object enters the camera and continues in a straight line until it is interrupted by the film. Therefore, light reflected from the bottom of the image travels straight through the lens at the centre and continues, still in a straight line, to the top of the film. And a light ray from the top of the subject travels to the bottom of the film.

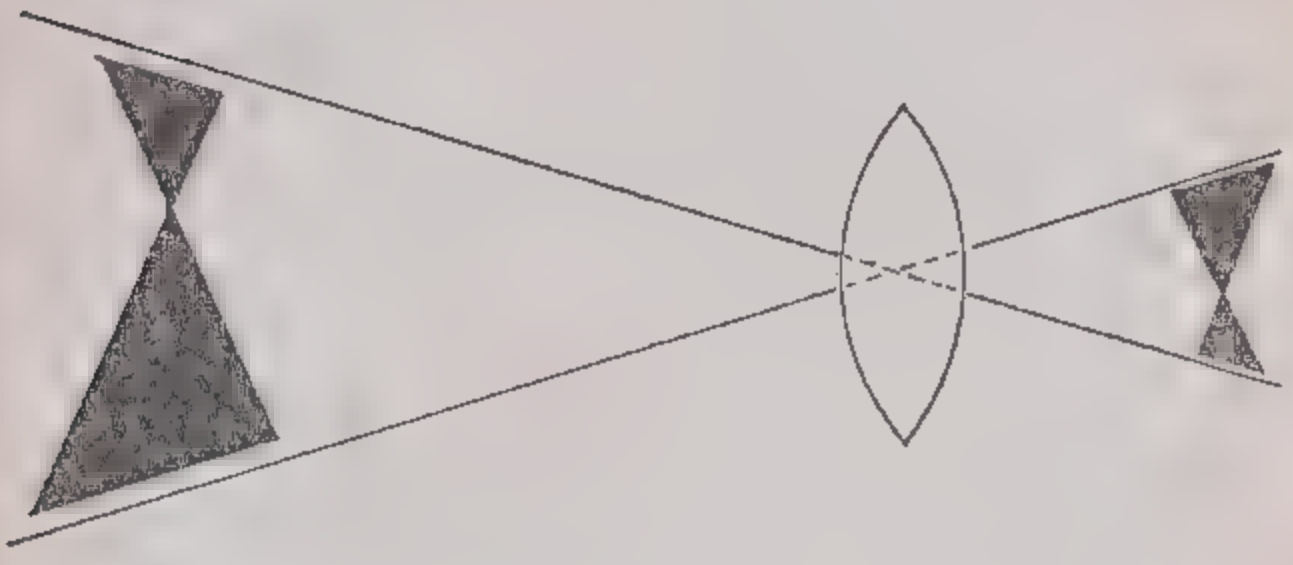


FIG. 3 How the image is formed upside down

Lens Construction

A lens is basically a circular prism. It would form a circular image too, if the negative area wasn't a square or a rectangle. But, despite its shape, it performs in every way like an ordinary prism by refracting the light rays to go in the direction which is needed.

However, it has the faults of a prism as well. Definition deteriorates towards the edge of the glass. The central portion produces the sharpest image as well as passing the greatest amount of light. The 'fall off' in definition can affect the entire photograph if the lens is used at full aperture. It performs much better if it is stopped down. Not all the way, though. It is a fallacy to believe that you will get the pictures with the highest definition when you shoot with an aperture of f22. On the contrary, overall sharpness

will suffer almost as much as if you shot the photograph at full aperture.

No, you must find the aperture which produces optimum results. Usually this is one or two stops down from full aperture. At this point, the definition is at its best.

Don't, however, think that the camera is unusable at full aperture. In fact you will probably wonder what all the fuss is about when you compare the results from pictures taken at full and optimum apertures. You will hardly notice any difference. But when you make gigantic enlargements you will see how the optimum aperture photograph holds together much better than those taken at any other aperture.

The more expensive lenses have just about every aberration eliminated and will produce adequately sharp pictures at any aperture. But they, too, have optimum apertures, a fact which will only be revealed when you make exceptionally giant enlargements.

Another difficulty a simple lens has is due to its very nature as a prism. Did you do experiments with prisms when you were at school? If so, you will probably remember that they split beams of white light into the many colours of the spectrum. Well, a lens will do this too. The trouble is, white light enters the lens as a narrow band and emerges as a broad band of the spectral colours – at a different angle To make matters worse, some colours are refracted more than others, and they will not all focus on the same point.

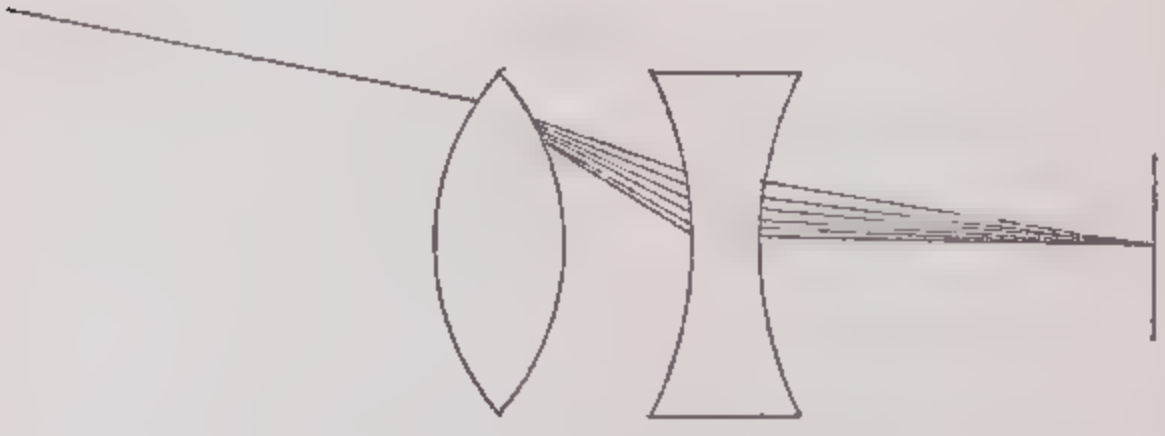


FIG. 4 Correcting astigmatism

This lens aberration is called astigmatism, and the only way to remedy this peculiarity is to catch the emergent colour rays with

another prism or lens to make them focus on a single and predetermined point. However, when we begin to add new lenses, it starts to become something more than a simple lens.

A fully colour corrected lens will have at least three glasses. You can't count them easily, of course, since they are housed in a mount. But such lenses have the word 'anastigmat' engraved on the barrel. If you are serious about photography, you need one of these lenses.

Focal Length

You will have seen the words 'focal length' mentioned in relation to lenses several times so far. It is the name given to the size or magnification of a lens.

Technically, it is the measurement between the centre of the lens (approximately at the iris position) and the emulsion of the film when the lens is focused on infinity. But in practical terms, you can take advantage of the manufacturer's act of benevolence and read what it says on the lens mount.

However, you may experience some confusion unless your mathematics are up to scratch By way of explanation, consider the standard lens on a 35 mm camera. You may see either 5 cm, or 50 mm, or even 2 in. on the mount. This is fine if you know how to convert one to the other. Thankfully most manufacturers of lenses are going metric. Just about all modern lenses are almost exclusively measured in centimetres or millimetres – mostly, due to public usage, the latter.

If there is to be constancy in photography, there has to be set sizes for lenses. They do vary, depending on the manufacturer, but only slightly. For instance you can buy 35 mm cameras with lenses of 'standard' focal lengths of 45 mm, 50 mm, 55 mm or 58 mm.

But, different formats require different 'standard' lenses, and what is standard for one format may be a telephoto or a wide angle lens for another.

A telephoto lens has a narrower angle of view than a standard; in effect, bringing the subject closer. The amount of magnification is decided by the focal length. Working again on the basis of a 35 mm camera, a 100 mm lens is twice as long as the standard lens, and is classified as a telephoto.

When you decide you need a lens of a longer focal length than

normal you must consider what you want to use it for before you make your decision. If you are a bird watcher, for instance, you will need a very long lens. Something like 400 mm on a 35 mm camera, or even bigger, would suit you. On the other hand, should portraiture be your forte, then you ought to consider nothing longer than 135 mm. This lens on a 35 mm camera will allow you to stay in the same room as the subject and fill the frame nicely. A 400 mm in a room would probably get you a magnificent shot of your subject's eye! That is if you could focus at that short distance.

There are three characteristics of telephoto lenses of which you should take note. The first is the tendency of long lenses to magnify camera shake. The longer the focal length of the lens, the more pronounced this is. You will find you must use faster shutter speeds than normal The minimum is generally 1/125 sec. If you have to use a slower one because of low lighting conditions, then you will have to resort to a tripod. You can experiment to find out how steady your hand is. In fact, you should before embarking on any serious shooting expeditions with your new acquisition.

The second characteristic is the limited speed of long lenses. This has nothing to do with the speed of taking photographs, or the mobility of the lens. You will hear from photographers that such and such a lens is slow, or that another is fast. It is simply a means of describing its maximum aperture and, therefore, its capability to admit light If a lens is potentially able to let in more light than another, it is said to be faster. For instance, an f1.8 lens is faster than one with a maximum aperture of f3 5.

What affects this? Well, the size and quality of the glasses for one thing. But there is another factor too – the distance the light has to travel before it reaches the film. As you know from your pinhole camera experiments, light intensity diminishes proportionately to the distance it has to travel. Light has to travel a greater distance through a telephoto lens because of its extra length. To have a lens speed equivalent to that of your standard lens, the glasses would have to be gigantic. Even now you may find that the glasses in your telephoto may be twice the size of those in your standard lens, but with a maximum aperture of only f4.

Thirdly, there is the question of depth of field. Once again that

'bogey' raises its head. But we cannot discuss lenses and lens performances without touching on it.

You may remember, in the last chapter where this subject was dealt with in detail, mention was made of the diminished depth of field you get with telephoto lenses. The problem arises because a long lens tends to 'concertina' everything up together. Objects in the foreground of the final picture look closer to objects in the background than they do to the naked eye. The depth of field gets compressed, too.

It simply means that you have to use a smaller aperture than you normally would. In any event your focusing will have to be more critical.

With these restrictions on shutter speeds, apertures and depth of field you may think that telephoto lenses aren't worth the trouble. But it is like everything else – provided that you know what the restrictions are, you will be able to handle them with ease. Foreknowledge is half the battle. Telephoto lenses just need a little extra care, that's all.

Wide Angle to Fish-eye

Wide angle lenses do not have the same restrictions at all. In fact, in the case of depth of field, the reverse is true. It is greater than on your standard lens. But for this depth of field bonus and the increased angle of view, wide angle lenses operate just like any other.

The one thing you must watch out for is distortion. Objects nearer the lens are magnified out of all proportion to those further away. It can be turned to your advantage, of course, for some unusual pictures, but otherwise it is a thing to watch out for. Faces, for example, do not look at all flattering with bulbous noses and tiny ears.

The effect increases as the focal length gets shorter. It is not so pronounced with a 35 mm lens on a 35 mm camera, but becomes more noticeable as you progressively transfer to 28 mm and 18 mm lenses. However, you can reduce the effect, even on the extreme wide angle lenses, by ensuring that there are no objects right in front of the camera. Keep your distance and you will get away with it.

There are two other peculiarities about wide angle lenses that you ought to know. First is barrel distortion. Shots of square- or

oblong-shaped objects, like doors and windows, suddenly take on a new shape in the photograph. Their sides appear to bulge outwards like a barrel. It is even more pronounced at the edges of the lens than at the centre, and the degree of barrel distortion depends entirely on the cost. A more expensive lens will be corrected sufficiently to counteract distortion of this type to a certain degree.

The second characteristic is associated to the first in that it again refers to distortion. Objects near the edges of the photograph seem to be flattened out and appear to be wider than they should be. This is because the glasses in wide angle lenses have to be large, and maximum use has to be made of the optics When the edges of the glasses must be used too, distortion becomes more prominent It is almost impossible to correct the edge of a lens glass. However, first-class photographs are possible with these lenses when handled thoughtfully.

Beyond the wide angle lens you will be entering the realm of the specialist. But there is one lens which has been taken to heart by amateurs because of the unusual results they get from it. The name of the lens is 'Fish-Eye' So called because it literally has the appearance of a fish's eye, and indeed acts like one, in that it has an angle of view of 180°. The distortion is incredible, but very characteristic. In fact it was the distortion effect that drew the amateur to it in the first place If you have never seen a photograph taken on one before, you will still recognise it first time by virtue of the fact that it will be circular.

You will be able to shoot many unusual photographs if you decide to buy a fish-eye lens. But, it is important to bear in mind that it is a gimmick lens, and must be kept 'in its proper place'. If you use it constantly, its effect becomes a bore.

All types of lenses are designed to fit directly on to your camera, or in some cases, to affix to the front of your standard lens. Those that function as an addition to your standard lens are known as accessory lenses. They are useful in that they extend the capabilities of a fixed lens camera, but the range is limited. Apart from the fish-eye, which does the same thing whether it is a prime lens or accessory, the telephoto and wide angle attachments will only alter the focal length by a little over one half.

For example, you can adapt a fixed 50 mm lens to a 90 mm telephoto or a 35 mm wide angle. To increase the focal length

beyond that produced by a telephoto accessory, you will need a monocular. This is literally half a binocular which fits to the front of your lens. There are no such restrictions to prime lenses of course. They can range over anything from 1,000 mm to 18 mm.

The one drawback to accessory lenses is the quality No matter how the manufacturers struggle to improve the glass in these accessories, the quality of the final picture still does not match up to one taken with a prime lens. But that is a small price to pay for versatility.

Close-Ups

No discussion on accessories would be complete without mentioning close-up adaptors. There are three adaptors available for taking your camera closer to the subject than the obligatory three feet. They are lenses, bellows and extension rings.

The close-up lenses have an appearance for all the world of magnifying glasses set in mounts. They are designed to clip on the front of your normal lens and have the effect of reducing the minimal shooting distance of anything up to 2/3.

The strength of a close-up lens is measured in dioptres. There are three strengths or magnifying powers, the 1 dioptre being the weakest and the 3 dioptre the strongest In practice they are known as close-up lenses 1, 2 and 3. Here are a few examples to illustrate the magnifying power and the differences between them

Camera setting	No. 1 Close-up Lens	No. 2 Close-up Lens	No. 3 Close-up Lens
Infinity	39 in.	19½ in.	13 in.
5 ft.	23¼ in.	14¾ in.	10½ in.
3 ft.	18½ in.	12¾ in.	10 in.

Simplicity itself to use, these lenses have the attraction of fitting any camera, even those with the facility of interchanging lenses. However, in common with all close-up devices, there is the disadvantage of a very much reduced depth of field. You will require a very small aperture to make sure that a three dimensional subject is in focus all over.

Distortion is also something you should watch out for. In fact, the effect is very similar to that produced by a wide angle lens. But this time you cannot avoid having subjects too close to the

lens. The only answer is to take great care over the angle you choose Sadly, close-up lenses were given the title of 'portrait lenses' at one time. It was a misnomer, and led to many unfortunate photographs. So be careful.

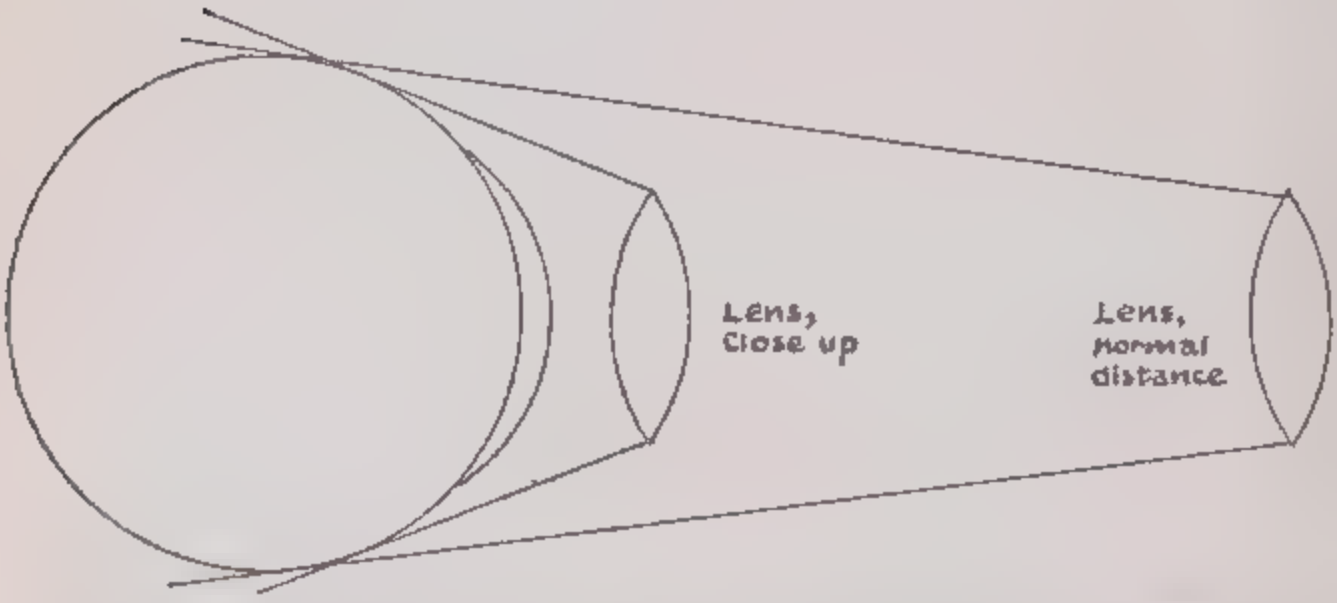


FIG. 5 Close-up distortion The crescent appears to be larger in comparison to the circle to the lens when close up, than it does when the lens is further away. The same effect will be present on the film if a photograph is taken too close to the subject

The other close-up devices rely on extending the distance between the lens and the camera body. The further apart they are, the closer you can approach the subject. You need to be able to remove the lens from the body, affix the device then place the lens on the front.

There are two types available, bellows and extension rings. Both work in the same way, but the bellows tend to have more flexibility than the rings. The extension of the bellows can be altered by sliding them backwards and forwards on one or two rails. But you can only alter the rings by unscrewing them each time.

The bellows are constructed like those old bellows cameras of a bygone age, with a lens/camera mounting on each end. You can lock them in any position on the guide rails by tightening a knurled screw to prevent movement during shooting.

The rings are constructed of a light alloy. Usually there are

three, all of which interlock with one another, and each is different in width. Any, or all of them fit between the lens and the camera and can be used independently of each other, in any combination of two, or, of course, all three together.

Again you will have to contend with a reduced depth of field, even more pronounced in this case because these devices allow pictures to be taken extremely close to the subject. They also have the set-back of emphasising camera shake. They act like a telephoto lens in this respect. You will find that it is extremely difficult to get sharp pictures with a hand held camera. A tripod is a must, especially when these devices are at full extension.

Another thing to watch for is the considerable light loss between lens and film. Similar again to the telephoto the light has to travel much farther than normal to reach the film – which means that the intensity will be much diminished.

To overcome this, you must make an adjustment by opening the aperture or reducing the shutter speed. The trick is to know by how much.

There is a formula to make the job easier. It is based on knowing the distance between the lens and the body of the camera. This is not so difficult as you might think. You will know the width of each extension ring. It is marked on the instruction sheet. If you have bellows you will see that the rail or rails along which they 'run' is marked in inches or millimetres. When you have ascertained what the distance is, you calculate the exposure compensation needed by using this formula:

$$\text{Equivalent f value} = \frac{\text{Aperture in use} \times \text{Distance from lens to film}}{\text{Lens focal length}}$$

Let us suppose your exposure meter suggests an aperture of f8. You are using the standard 50 mm lens on your 35 mm camera and the distance between the lens and the film is 100 mm. Now, the formula would look like this:

$$\frac{50}{8 \times 100} = 16$$

The answer does not tell us what aperture to use, it tells us what the f8 set on the lens effectively is. In other words, the light intensity has been reduced by four times. To expose the film correctly you will have to open your aperture by two stops.

Gadgetry Explained

Other accessories you will need to include in your collection of equipment are minor by comparison. You will have to add a lens hood, a filter or two, and a tripod. Lens hoods are available in all shapes and sizes. There are metal ones which are good and sturdy, but you will have to remove it every time you want to close your ever-ready case, and there are rubber ones which fold back over the lens barrel when the camera is not in use. Functionally, there is nothing to choose between them.

A lens hood is designed to prevent stray light from striking the lens at an odd angle and causing flare on the film. You should never take a photograph without a hood in place. But you might as well not have one at all if the diameter is too wide or if it is not deep enough to be effective. On the other hand, you should check that it isn't so small that it cuts off the corners of the photograph.

Filters will be dealt with in detail in a later chapter, but to get you started, you might consider buying a medium yellow filter for black and white photography, to 'bring out' the clouds, and a haze or ultra-violet filter to stop excessive blue casts in outdoor colour. They should preferably be constructed of glass, not gelatine. Glass is much more durable and will not scratch easily.

However, it does not matter what the material is, you should treat it with as much loving care as your lens. Clean it gently, only touching it when necessary. Try a blower first. A rubber ear syringe will remove all but stubborn dust. If that fails, then try a gentle sweep with a blower brush.

Finger prints should be removed with lens tissues – a clean one every time. Above all, do not use a handkerchief, because it is certain to scratch the surface and impair the quality of your pictures. Sharpness will suffer as will the ability of the filter to transmit light.

The medium yellow filter already absorbs a certain amount of light. When you use one you must compensate by opening the aperture one stop over and above that established in the exposure reading. But, when it gets scratched badly, a greater compensation will be necessary.

For the record, the haze or ultra-violet filter only stops the invisible U V. light. You do not need to compensate at all.

Finally, the tripod, which is also dealt with in a later chapter, always seems to be the weak link in a photographer's equipment. Portability appears to be the criterion, and as a result, sturdiness goes by the board. A tripod is supposed to be a support to keep the camera steady when you are using shutter speeds longer than normal, or at any other time where camera shake is likely to occur. Unless you have a rock-steady tripod, you will only have limited success.

There are one or two points you should look for when buying a tripod. It should have no more than three leg extensions, preferably only two. When the legs are fully extended it should be steady to all but moderately violent 'jogging'. Finally, it should have a ball and socket, or a pan and tilt head to allow you to point the camera in any direction, horizontally or vertically, without having to move the tripod.

Accessories are important to build your camera system. Some of them are vital to basic photography like the lens hood, while others, such as telephoto and wide angle lenses can wait for a while. As I warned in the beginning of this chapter, it is easy to become a gadget maniac. No hobby is inexpensive and photography is certainly in the top twenty for pocket-robbing. But you can keep the cost down by only buying what you need and are capable of using at that time. You can get the rest later, bit by bit.

CHAPTER THREE

Films and Practical Exposure

When all is said and done, the film is the most important part of the photographic process. It is, after all, the emulsion which records the image. Yet it suffers considerable abuse by amateur photographers.

It is no good pointing the camera at the subject, pressing the button and hoping for the best. Certainly you will get some sort of image. Films are resilient enough to cope even with this treatment. But what sort of image will it be? Probably heavily over exposed. The negative will require a lot of ingenuity on the part of the printer to produce a half-way decent print.

Let's start a 'Be kind to Printers Club' right now. Raise your right hand and say after me:

'I swear, never again to be inconsiderate to my photographic printer by taking pictures without concentrating on producing anything but the finest negatives.'

Now you have done it. Go back on your oath and you will be plagued with inconsistent and poor negatives forever.

Success in anything is the result of prior knowledge and practice. To be successful at making optimum exposures you need to know something about films. Only then will you be able to get the most out of them. We are back to the same old argument – know your medium.

Many amateur photographers experiment with films throughout the year. Avoid this if you can. If you keep chopping and changing films constantly you will not really know any film very well. You will never be able to get the most from your photography because every picture you take will be a gamble. It is quite probable that, given time, you will be so familiar with your

camera that you will get a photograph every time. But will it be the best?

How can it be? Different films have different characteristics. It takes time and a lot of experimental shots to discover not only how the film reacts, but also how it functions with your own equipment.

Even though these differences exist between films, there are certain characteristics which are common to all. These are colour and light sensitivity.

So that you understand the mechanics of both, it is necessary to take a glimpse at how films are made. Find an old piece of unexposed film and have a look at it You will see that there is a clear base with a light sensitive emulsion covering one side. This emulsion is made from gelatine liberally sprinkled with additives to make it respond to light.

Gelatine is the ideal emulsion medium. It liquifies in heat and solidifies in low temperatures. When it is in its liquid state other products can be added. The whole concoction is then stirred vigorously, and when the gelatine cools and hardens the additives remain dispersed evenly throughout. It becomes a sort of carrier.

It is the additives which make the gelatine light sensitive. The most important are silver halide crystals. These crystals are extremely sensitive to light, and when exposed, turn black. During the processing, they are reduced to metallic silver, and while some are washed away, the majority remain distributed throughout the gelatine base to form an image.

This description is very simplified. Don't think that this is all there is to it. No one is actually quite clear about what occurs when film is exposed. There are many theories, but no one knows for sure. Scientists will find out one day, of course, but until then you and I will have to make do with theories.

Film sensitivity

Variations in the manufacturing process will produce films with different characteristics. For instance, emulsions are colour sensitive. They react to various colours and translate them into different shades of grey. If films reacted to all colours in the same way, you would end up with a single tone of grey on the exposed film, instead of a negative.

Look at one of your recently taken black and white photo-

graphs. It may be a picture of your wife or girl friend. Notice the different shades of grey in her clothing contrasting with yet more shades in the background. You know the grass is green and the sky is blue, and you can see how they have been interpreted by the film, but what were the colours of her clothing? See how they have been translated.

It is almost certain that you use panchromatic films. The word 'panchromatic' means 'all colours'. As its name suggests, a film of this type is sensitive to all colours in the visible spectrum. Most films you see on the shelves of your photographic dealers are panchromatic. But there is one other available which you may see around from time to time. It is mostly used by professionals for special subjects, and is called orthochromatic film

When this emulsion was first discovered, the photographic world was so excited that it gave the film the name of 'right colour'. Unfortunately, it is a misnomer. The emulsion is only sensitive to a part of the visible spectrum, blue, green and some yellow. However, it served photographers well for a number of years until the arrival of its successor.

Even among panchromatic films there are colour sensitivity variations. These are the result of modifications to the emulsion making process to increase the speed to which a film reacts to light. Emulsions with a high sensitivity to light are also sensitive to the red end of the spectrum. In practice you will find little difference to the appearance of the finished picture, except for an almost imperceptible variation in the colour interpretation, and you will find that it has a better sensitivity to the dominantly red artificial light.

You need a variety of film speeds to be able to match the right film to the right subject. Each emulsion has a different job to do. Not that some films will not do all the jobs. They will, and in many cases, perfectly adequately. But if you choose the right film for a specific subject, given the correct exposure, you will get optimum results.

There has to be a consistency of speed in each group of films. As you have already seen, you get the best results by knowing your film well If you use a specific film most of the time you can expect its sensitivity to be consistent. One of the characteristics of the films you use which you will have stored away in your memory cells, will be its speed. If you can't trust that, and

it is different each time you buy one, you will have to learn anew on each occasion.

You must also have a system of assessing film speed without stepping into the realms of science and mathematics. Film manufacturers in the past have all had a go at developing their own systems of measuring film speed, which, for a while, did nothing to make exposure measurement easy. Fortunately, over the years most of the photographic fraternity has settled down to using two – ASA (American Standards Association) and DIN (Deutsche Industrie Norm). DIN, as its full name suggests, is of German origin.

The two systems are concurrent in use, and it is a matter of choice as to which one you use. Just about all exposure meters and films are marked with both, so you will not be at a disadvantage whichever one you decide to apply to your photography. The important thing is to make up your mind at the beginning and stick to it. Don't chop and change. It will only lead to confusion and your standard of picture taking will suffer.

You will hear of other systems such as BSI (British Standards Institute) identical to ASA, but has succumbed to the weight of the latter; H & D (Hurter and Driffield), the first system devised, which is now defunct; Weston, invented by the well known exposure meter manufacturer, now also conceded to the ASA victory; and finally, Gost. This is the current Russian system.

Apart from academic interest, they will have little effect on you. Should you buy an old Weston Master light meter, then you will need to know how to convert. The same goes if you acquire a Russian meter or film originally made for the home market. All their export goods bear ASA and DIN ratings. Charts are available to convert one to the other, your dealer may be able to tell you where you can get one.

Films are manufactured in three main speed groups. There are slow films rated at 20 to 64 ASA (14 to 19 DIN), medium speed films at 80 to 200 ASA (20 to 24 DIN) and super speed films rated at 400 ASA (27 DIN) and above. In addition to these speed differences, there are certain characteristics which are inherent in each group.

As the film speed increases, so the grain becomes more prevalent. This phenomenon is the result of the silver halide crystals clumping together in the negative during development. In an en-

largement it shows as dots all over the image. Modern emulsion manufacturing techniques have minimised this clumping in the faster films, to such an extent that, even in gigantic enlargements, grain is no longer offensive. The slow films are practically grain-free, of course.

Another factor which makes the fast films popular is their wide latitude. They are able to cope with extremes of light and shade, recording detail in both at the same time.

These 400 ASA plus films enable you to move about taking photographs much more freely without fear of being confronted by a situation with which your film cannot cope. From bright sunlight to a dingy cellar, a fast film, handled carefully, will produce an image.

While medium speed films have less latitude capabilities, they are very popular. Many amateurs use them most of the time because they are 'middle-of-the-road' films. Not too much grain, coupled with reasonable emulsion speed, makes them ideal for general purpose photography. In fact, you will find that most dealers will recommend a film in this group when asked.

Emulsions in the 20 to 64 ASA group are known as high contrast films because of their narrow latitude. They require a great deal of care even for the most general of pictures to keep the contrast down to manageable proportions. Not so widely used because of their inhibiting emulsion speed, they tend to be used for special techniques and on subjects where fine detail is needed.

Whichever film you are currently using, you can't escape the necessity of aiming for an optimum exposure. Certainly, the faster films with their wide exposure latitude will 'absorb' considerable error in light measurement, but the quality of the final print will suffer as a result. For first-class pictures, your exposure techniques must be spot on. Any errors will show up most prominently in slow films, with unprintable negatives. Treat all films as though there were as little room for manoeuvre.

Exposure meters

Before looking at exposure in depth, let's go over the tools of the trade. The days of guess exposure are gone, exposure meters are available to all. No self-respecting amateur cameraman should be without one. This is not to say that you should be a slave to an exposure meter. You should be able to work without one in

an emergency. But only a light meter used properly will enable you to get consistently correct exposures.

There are two basic types of meters, each of which is subdivided again. It is the mechanics of the meter which creates the first division. The two types in these groupings are called the selenium cell, and the cadium sulphide or Cds meter. Both do the same job, but they work differently.

The selenium meter is powered by an electric current generated by the light. Light entering the cell, is converted into an electric current which operates the needle. The exposure value is denoted by the needle, which tells you what shutter speed and aperture to use.

The Cds meter is activated by an electric current, but this time the power supply comes from a minute battery. The cell gauges the level of light, then indicates the exposure value with the needle in the same way as its selenium sister. These meters generally have an on/off switch to preserve the battery, although some of the newer models are without. The manufacturers say that when the meter is in the case so little light manages to reach the cell that the meter is, in effect, switched off. There is no power drain at all.

Gradually, the Cds meter is replacing the selenium cell for general amateur photography. Both are still available, but the Cds type has swamped the market. Most modern amateur cameras with built-in meters are fitted with the Cds type. It has revolutionised metering.

The reasons are not hard to find. To begin with, the Cds meter is much more sensitive. It will give an accurate reading in both bright sunlight and very low light. When they first arrived on the scene, the advertisements of one said that it was so sensitive that you could get a reading from the moon! The very fact that they had this ultra-sensitivity created a boom. Everyone wanted a Cds meter. It didn't matter that they may never have to take a light reading from the moon. Just to own one was enough.

To facilitate such wide extremes of light measurement, these meters are fitted with a special high/low switch. In reality, the 'low' position is a booster. You simply operate it when you want to take photographs in low light levels. Selenium meters, having no such booster, barely react to dim light.

But the Cds meter is not the complete answer to exposure measurement problems. One set-back is that they have a 'memory'

for light. Unlike the selenium cell, which will immediately indicate the intensity of the ambient light, the Cds type, when it is first switched on, will begin by recording the previous reading. It will remember what the light level was last time you used it. This is especially the case if the last reading was higher, or if the 'low' switch had been used.

It will eventually settle to deal with the immediate situation, but it will take a little time. If you do not make allowances for this fact you may find that your exposures will be somewhat erratic. Never, except in the case of a dire emergency, take the first reading given by a Cds meter. If it is fitted with an on/off switch, operate the switch two or three times until you are sure that the needle has settled – then shoot.

Don't let the battery put you off. You won't be running to your photographic dealers every few weeks for a new one. They last for months, sometimes years. Nor do they 'fade' slowly. That would be disastrous for exposures. Imagine a battery getting weaker and your negatives progressively getting more and more overexposed. The thought makes you shudder. No, fortunately, they die suddenly One day you will get an accurate reading, the next, you will get nothing.

Balancing the light

The second division into meter categories has arisen as a result of the development of Cds meters in an attempt to get more accurate readings, and to minimise the human error factor. Manufacturers have produced a meter which works just like a telephoto lens. They are called 'spot meters'. The narrow angle of view enables the photographer to measure a very small section of the subject. In fact, the area they measure is so small that you have to look through a built-in viewfinder.

To understand why such a meter has been developed, it is necessary to appreciate what happens when light enters the cell.

In all meters the cell gathers the varying intensities of light and mixes them all up. When the average has been calculated, the needle quivers to a stop. This 'average' point becomes the medium grey in the finished photograph. All the other intensities or tones settle down in relation to this average.

The system works fine unless you have an overabundance of bright light or shadow. This predominance of either tone upsets

the calculations of the 'average'. For example, when you take an exposure reading of a landscape, if you include too much sky, the meter cell will be receiving excessive brightness. It will base its average on the brighter light of the sky. All the important tones will then be 'pushed' down the scale, resulting in an under-exposed foreground. The sky, of course, will be beautifully exposed.

The main problem with standard exposure meters is that they have too wide an angle of view. It is all too easy to inadvertently get an inflated reading from the sky or a large expanse of water. A careful selection of viewpoint will help, but a very much narrower field of view would be of greater value.

This is where the spot meter helps. Functioning in the same ways as the standard meters, it also produces an average from the variety of tones within the field of view. But the area it 'sees' is very much more reduced, and it is easier to exclude dominant bright or dark tones which will induce a false reading.

With such a meter it is possible to select the tone you want to see reproduced in the photograph as medium grey, and expose for that. However, it is not always so easy as it might appear. It is not a simple matter to choose the best tone for exposure evaluation. Yet another problem is how to get an average reading of the entire scene. Both will require some working out. While it isn't a bad thing to get your brain cells working, in both examples a standard light meter will handle the situation with little or no difficulty.

In effect, there is a case for both types of meters, neither of them is the 'perfect' one. It isn't necessary to have both, either. If you can afford it, all well and good, but you will be able to handle most situations with one or the other, provided you use the meter thoughtfully.

Meters in action

Both spot and average meters are being built into cameras these days – sometimes both in the same camera – and of course, they are also available as separate pieces of equipment. To help you decide which one you need, here are a few subjects you will frequently be confronted with, and the best ways of handling them with both types of exposure meters.

Subject	Average Meter	Spot Meter
Portrait of girl with heavily shadowed doorway or porch in background.	Take meter to subject excluding all but the face from the cell.	Take a reading of the face from the camera position.
Portrait of girl with bright sky behind.	Take meter to subject ensuring that no sky light enters the cell.	Take a reading of the face from the camera position.
Yacht sailing in bright sunlight.	Take a reading from a nearby object of the same tone in the same light.	Point the cell at the most important part of the subject.
Landscape framed with trees.	Incline meter downwards to exclude the sky. Ignore the foreground trees.	Select most important part of subject, or take an average reading by measuring the brightest tone (excepting the sky) and the dullest, and averaging the answer.
Single rose on a bush.	Take meter close to subject. Make sure meter does not cast a shadow, affecting the reading.	Take a reading from any position where the subject fills the viewfinder.
A black dog on a beach in the distance.	Take a reading from a nearby object of the same tone in the same light.	Read from the camera position if the subject fills the viewfinder.

Subject	Average Meter	Spot Meter
Group of people standing in shaded porch.	Take the meter to subject if possible. Or take reading of similar subject in same light.	Take a reading of subject from camera position.
Street scene through a shop window. Camera in shadow and subject in light.	Take meter close to the window or outside to get reading.	Take reading of subject from camera position.

You will be able to find parallels for all the illustrations mentioned in the chart. You can see that any type of meter can be used to solve any type of problem, if you approach the subject thoughtfully. In each chapter we will be looking at problems of exposure of specific subjects, but this thumbnail description of techniques will start you off using your meter intelligently.

Before moving away from the subject of meters, there is one other type which you ought to know about. Until now you have been reading about meters which measure light reflected from the subject, but it is also possible to measure light falling on the subject. Technically, this is known as incident light. Special meters are available to read incident light. They have a three dimensional translucent cone covering the cell which collects the light and, as in all meters, 'average' it out.

You can also use a standard reflected light meter for incident work. Most are fitted with a translucent screen of some sort which slides in front of, or clips over the cell. You then use the meter by pointing the cell in the direction in the light source.

Incident meters are constructed to be used in the vertical position, as opposed to the horizontal reflected light meters. They have a specially designed swivel head which allows you to face the cone towards the light source from the camera position, as in the case of side lighting. You can also rotate it 180°, replace the cone with a grid, and convert it to a reflected light meter.

The job of measuring contre-jour, or back lit and side lit subjects, is made easy by incident light measurement. There is no

risk of the meter being influenced by dominant background tones and the three dimensional, light-catching cone duplicates the three dimensional subject, ensuring accurate and sensitive metering.

Let us go over the subjects we looked at when reviewing how spot and average meters compared in use, and see how reflected and incident meters compare.

Subject	Average Reflected Meter	Incident Meter
Portrait of girl with heavily shadowed doorway or porch in background.	Take meter to subject excluding all but the face from the cell.	Take a reading from the camera position of light falling on subject.
Portrait of girl with bright sky in background.	Take meter to subject ensuring no sky light enters the cell.	Take a reading from the camera position of light falling on subject.
Yacht sailing in bright sun light.	Take a reading from a nearby object of the same tone in the same light.	Take a reading from the camera position of light falling on the subject.
Landscape framed with trees.	Incline meter downwards to exclude the sky. Ignore foreground trees.	Take a reading in the normal way ensuring the meter will not be influenced by light reduction from overhanging branches.
Single rose on a bush.	Take meter close to subject. Make sure meter does not cast a shadow affecting the reading.	Take a reading in the normal way and open aperture by one stop, or use as reflected light meter.

Subject	Average Reflected Meter	Incident Meter
A black dog on a beach in the distance.	Take a reading from a nearby object of the same tone in the same light.	Take a reading in the normal way and open aperture by one stop, or use as reflected light meter.
Group of people standing in shaded porch.	Take the meter to subject if possible. Or take reading of similar subject in same light.	Take the meter to the subject and measure in the normal way.
Street scene through a shop window. Camera in shadow and subject in light.	Take meter close to window or outside to get a reading.	Take a reading in the normal way outside the window, or use as reflected light meter.

Now that you understand something of light meters, it is necessary to look at factors affecting exposure of film. To do this we must draw in a number of points which have already been discussed and put them in perspective. You will appreciate their value much more when you view them in relation to each other.

You will remember that we looked at the matter of exposing for a landscape and avoiding the excessive brightness of the sky. This, because the range of tones between the sky and the foreground is too much for the film to cope with. Therefore it is necessary to ensure that the brightness range of a scene is not so excessive that one or the other suffers in the final negative. The ideal exposure is when the brightest part of the scene has not completely 'burned out' the highlights in the time needed to allow details to record in the shadows.

However, there is another modifying factor which you must consider. A film is capable of handling a brightness range of some 500 : 1, or even greater in some faster films. But, the paper on which the negative will eventually be printed only has a

maximum range of about 60:1. The harder papers have even less – only 10.1. This limited latitude must be taken into account when you are considering the contrast in a scene.

Development will be discussed in detail in another chapter, but it is not possible to talk about exposure factors without touching upon it. You have to see development in relation to the timing or exposure because it has a marked effect on contrast. For instance, if you develop a film beyond the normal time, contrast will steadily build up. Exposure itself only affects the density of the negative.

Now we have two more factors to consider in our quest for the optimum negative – density and contrast. The two are inextricably linked.

Correct exposure and development will produce a negative containing a good range of tones with detail in the shadows as well as the highlights. Deviations from this will cause faults which produce inferior prints. The difficulty experienced by a beginner is that he fails to recognise the difference between a dense negative and a contrasty one. It takes some experience, but to help you recognise which is which, study the following notes carefully and compare them with any faulty negatives you have.

An underexposed negative lacks detail in the shadow areas. No juggling of development will cure it. Underdevelopment of an underexposed negative only exaggerates the deficiency. Shadow detail will be absent, and even the highlights will be thin. Develop it correctly and the only change will be more detailed highlights. Overdevelopment compounds the felony. Highlight areas block up and still the shadow areas remain detail-less. In short, no alteration to development times will put details in an area of a negative where no details were originally recorded.

A correctly exposed negative has detail throughout. Should you underdevelop the film, the negative will be flat and without any contrast. Overdevelop and you will increase the contrast beyond reasonable limits. There will be detail in the shadow areas, but the highlights will block up, losing detail in the process. You will recognise the negative which has been correctly exposed and correctly developed by the detail throughout and the wide range of tones.

Overexposure produces dense negatives. Trying to retrieve them by underdeveloping will only help in a limited way. You will see

the shadow and highlight detail, but the negative will be flat overall, reducing even the normal brightness range. However, if the original scene is excessively contrasty, this technique used deliberately may just save the day.

Normal development of underexposed film will cause the highlights to burn out and the shadow areas to solidify. There is a loss of detail in both, and the negative will have an overall heavy density. You will make matters even worse by overdeveloping. In fact, if you inadvertently overdevelop an overexposed film you might as well go out and shoot the picture all over again. This negative will be thick and heavy and make printing extremely difficult, if not impossible. All highlight detail will be completely lost and the shadow areas will print as grey, losing all of their richness.

There is nothing to prevent you from experimenting for a creative effect with any combination of these exposure/development ratios. You will find it interesting as well as instructive. In fact, you might undertake to produce these effects deliberately and keep them as a guide. They will be worth a thousand of my explanatory words. Try it and see for yourself.

But don't let it lead you away from producing the ideal negative. Aim for it on every normal photographic occasion. Ninety-nine per cent of your pictures should be shot with this in mind.

When you are satisfied that you can produce a good negative time and time again, you can embark on techniques which will allow you to deliberately under or overexpose to achieve a special effect. It is called 'keying' the exposure. The technique is dependent on the tone you choose to measure.

For instance, if you take a reading from the highlights the meter will go through the usual process of scrambling and come up with its 'average'. It will treat the measured highlight as the norm, and all other tones will be adjusted accordingly. In this example, inasmuch as you have measured for the highlights, the other tones will be lower or darker. They will be pushed down the scale. The picture will appear dark and sombre, and is known as 'low key'.

Do the opposite, that is, measure the deepest shadows or darkest tones, and all the other tones will be pushed up the scale to produce a 'high key' picture.

Both are legitimate techniques which, with the right subjects, make very effective photographs. If you feel that these extremes overdo it, then select a tone to measure somewhere nearer the middle. By doing so you will adjust the tones only slightly up or down the scale to create the kind of atmosphere you think it needs.

But bear in mind the subject must suit the mood. A blonde dressed in light clothing in front of a light background is a natural for 'high key', while a common 'low key' picture is a night street scene. There are plenty of specific examples mentioned in the chapters to come, watch out for them.

In the meantime get the combination of your favourite film, exposure meter and camera right. Practise until you know their reactions intimately, and using them becomes second nature. Then, and only then, will you be anywhere near producing optimum negatives consistently.

CHAPTER FOUR

Filters and Lighting

One thing you should be discovering as you read through this book is that you must strive to produce the best work at all times. The fact that you have chosen to learn a bit more about your hobby indicates that you want to break free from the restraints of purely record photography.

Despite the obvious mechanical trappings, you can inject a good deal of creativity into your picture taking. Each of your shots, with a little effort and much practice, will bear your stamp. You will develop style. In time, that style will be recognisable as yours to all who view it.

However, we all have to crawl before we can walk. To begin on the long road to independent style you must start like everyone else and learn the basics. All tyro photographers turn out similar work because they employ the same 'rules and regulations'. It is only later, as they become more confident, that they set about bending the rules to suit their own purposes.

It is just like laying the foundation of a house. Understand what makes a good picture and you can duplicate it. As a part of your development, you should study the masters of photography and their work, and even copy them to start with. There is no finer training ground. As you become more deeply involved, and the names of top photographers mean something, select one or two which you think stand out.

Ape their work. They have styles you like, so why not learn it from them? But don't do it blindly, analyse the pictures first.

What sort of lighting has he used? How has he chosen his camera angle? Did he use or break the rules of composition? If he has broken them, why? And so on. Ask as many questions as

necessary to help you understand the pictures – then take your own versions.

You may ask where such action is going to take you. Is it going to develop your own photographic style? You obviously have no wish to become a poor man's Cartier Bresson, or W. Eugene Smith. You want to be yourself, and you want it to show in your pictures. So it will, given time. First learn how the expert thinks and how he creates a winning picture. Then, having put yourself to so much trouble, it will stick in your mind. You will soon begin to apply his techniques automatically, but more important, with your own embellishments – your own style.

You might almost look upon this as a short cut to successful photography. Other 'go it alone' tyros wallow about in the uncertainties of not really knowing whether they have style or not. Their own free expression is shackled by the fear of bending established photographic rules.

Forget long, involved, totally unproductive discussions and self-searchings on personal style. It will come. It sneaks up on you without realising. Don't waste time seeking it, or you will grow an ulcer worrying. Blandly shoot away expressing yourself the best way you know how. How far you can go depends on your ability. Your horizon extends as far as your expertise can 'see'.

But enough of psychology – there is work to be done. Now that you have this short cutting, step-by-step plan of action to improve your over-all technique, use it as you progress through the book. But you must begin at the 'crawling' stage. All this technique does is speed up the time in which you begin walking, and finally running. In the meantime, you must start where even your photographic heroes began, with the ABCs.

Use the Spectrum

The creative exploitation of light will play a prominent part in your development. Thus far, the subject has cropped up often and you are not finished with it yet. Now is the time to learn the full meaning of the term 'Painting with Light'.

Let's begin by taking white light and projecting it through a prism again. See the colours? A prism helps us to see that, in reality, white light is a continuously varying band of colours ranging from violet to red. It is possible to measure these colour wavelengths. Of course, you will not go around measuring them

consciously in your mind's eye, or even recalling them, but it is a useful reference to know them.

They are measured in Angstrom Units. Each colour has a wavelength of a certain number of these units.

Violet	Blue	Green	Yellow	Orange	Red	Deep Red
4000	4500	5000	5600	6000	6400	6800	7000

To give you an indication of the length of an Angstrom Unit in everyday terms, one AU equals one hundred millionth of a centimetre.

However, in reality, light waves extend beyond what you can see. The eye is only attuned to wavelengths between about 4,000 Angstrom Units and about 7,000 Angstrom Units. Wavelengths shorter than violet become ultra-violet rays. These are the rays which give you sunburn. You can't see them, even with a prism, but they do have an effect on your eyes in the form of an irritation.

At the other end of the scale, beyond the red, are more invisible rays, this time infra-red. The peculiarity about these two invisible rays is that ultra-violet is destructive to photography, while infra-red is constructive. The latter can be used for a special kind of photography.

You will have seen television and cinema spies in action, using infra-red to further their work. The invisible light allows them to photograph in the dark. Such photography does demand a special film and a special filter, but it is possible. However, most of its applications are of such a specialised nature that it need not concern you at this stage.

Ultra-violet rays will demand your attention at this juncture though. While they are invisible, you will almost certainly have seen the effects. The blue haze over the distant mountains or sea is typical. You will recall that it cuts down visibility, and when you try to photograph the subject you will find that the film actually exaggerates the situation.

The eye irritation mentioned earlier is very similar to the reaction on the film. Ultra-violet rays irritate emulsions too. While glass is virtually opaque to ultra-violet rays (remember, you cannot get sunburned under glass), some, very near the blue end of the visible spectrum, do pass through the lens. So, to stop the irritation, something more than plain glass is needed.

The answer is found in any good pair of driving glasses. Instead of being dark like sun glasses, they are usually amber or yellow. Yet they are just as effective, in fact, in some ways better. They cut through ultra-violet haze like the proverbial hot knife, and all that.

To understand why, it is necessary to return to the colour spectrum. Continuous though it might be, the complete spectrum can be broken down into just three basic colours. These are known as the primary colours. They are Red, Blue and Green.

Now if you mix two of these colours together, you get still another colour which is opposite or complementary to the one which hasn't been mixed. For instance, mix red and green light and you get yellow. This is the complementary colour of blue. Remember that you are mixing light, not paint, so the resultant colours will not be what appears to be obvious. This progressive mixing of colours is known as Additive Colour Synthesis.

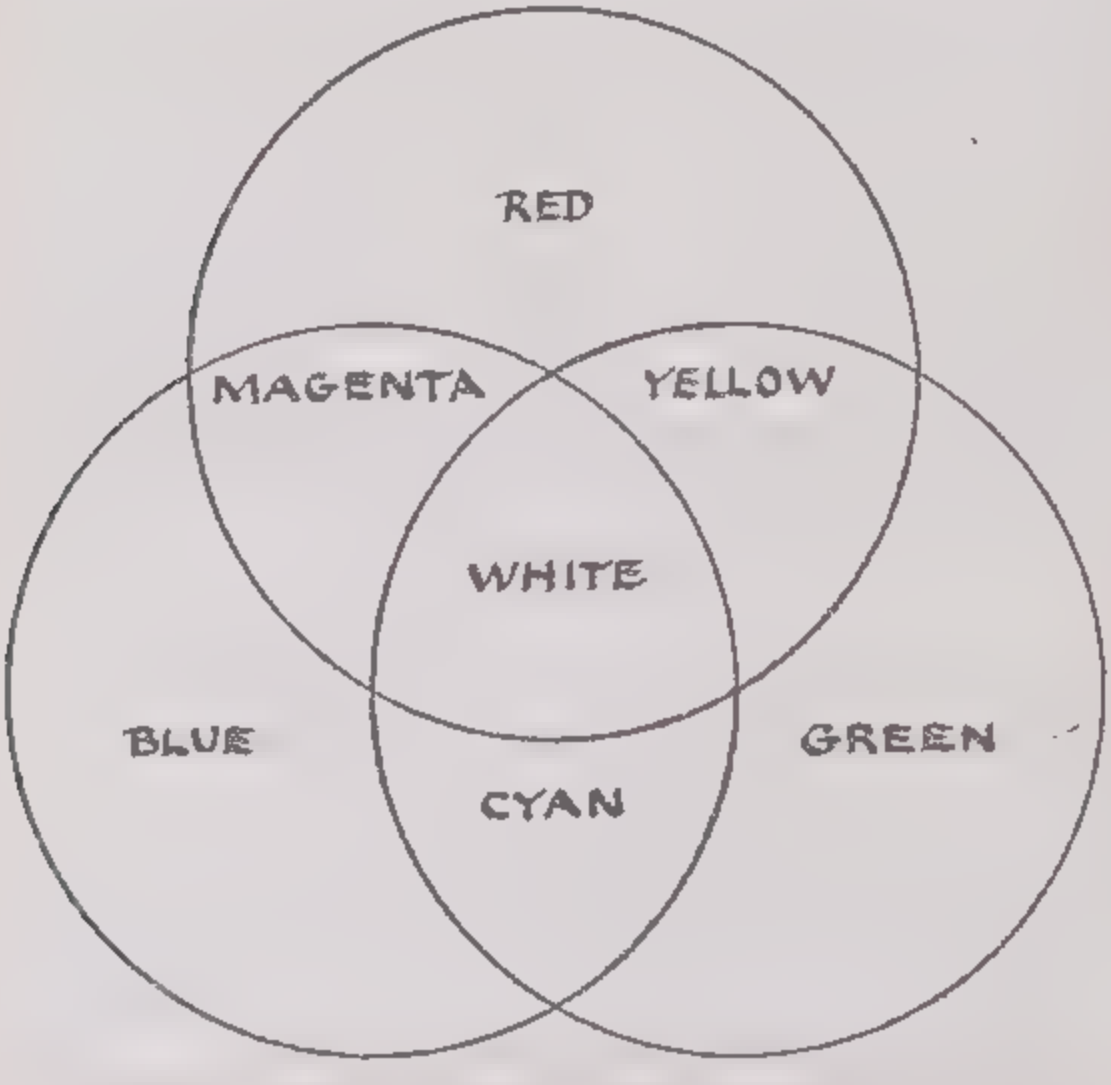


FIG 6 Additive colour synthesis. The progressive mixing of the primary colours to make white light

With this experiment we have discovered that the complementary colour of blue is yellow. This means that yellow or amber driving glasses have a special property. They hold back ultra-violet and blue rays, in effect, filtering them out.

So, to cut through the haze effects of ultra-violet and stop the irritation of film emulsions you need to find something similar to driving glasses – a yellow filter.

Filters and the Spectrum

But what about the other colours in the spectrum? You have already learned that modern panchromatic films are sensitive to all colours With specially designed filters you can control and modify the film's interpretation of the colours in subjects.

Take the colour red for instance. When photographed unfiltered, red is interpreted on film as a dark grey. If you want to alter it, say to make it lighter, then you will have to use a red filter. It has the ability to filter out the other colours, or to stop them to varying degrees, and allow red to pass unhindered. Because so much light has acted on the emulsion from the red objects, those portions of the negative will be very dense. When they are printed, the denseness will hold back the light from the printing paper and record it as lighter in the final photograph.

The same happens when you use any other colour filter. It makes objects of the same colour record lighter in the photograph. If you want it to be interpreted as a darker grey you have to find the complementary colour. This brings us back to additive colour synthesis. To find the complementary colour of red we have to mix the other two primary colours - blue and green. The result is cyan. So, with a blue-green or cyan filter we can make red objects almost black in photographs.

Mix red and blue and you get magenta (purple), which is green's complementary colour. When you apply this synthesis to filtering, you will find that a primary colour filter will cause the complementary colour, or either colour which mixes to make the complementary, to record darker or black in the final print.

Now look at the control you have. For example, if you were photographing two cars, one green and one red, use a red filter and the red car will appear to be light and the green one almost

black. Photograph them through a green filter and the tones will be reversed.

Yellow, the filter which was discussed first, does not quite fit in the same category as the others. It has special properties. You might expect blue, green and red to experience tone shifts, when in fact only blue does. But the two yellow filters, light and medium, only reduce violet and blue in the visible spectrum – one with more strength than the other. You might say that it has 'minus' blue properties.

Try an experiment with a yellow filter for yourself. Take a photograph of a scene which contains a considerable amount of blue sky. If there are clouds in the sky, so much the better. Now, shoot first without a filter, then with a yellow filter in place.

Compare the results. You will not have any difficulty in sorting out which is which. The unfiltered shot will be very much 'soot and whitewash'. The sky, with its excess of blue, will record on the print as a large expanse of glaring white. Any clouds will have disappeared into the toneless background and the foreground interest will have been very much reduced to a silhouette in comparison.

Then look at the filtered shot. You will see a vast difference. The very much reduced blue, thanks to the filter, will have allowed the sky to be reproduced as a definite tone. It will be darker in the print. The clouds will be visible and the foreground will somehow have achieved a certain sparkle. All in all, a much better picture.

Despite the speciality of panchromatic films to react to all colours, when used in conjunction with a yellow filter the final print seems to acquire a little extra something. The tones are more delicately graded and full of life. If you want to see the incredible difference, try shooting a portrait with and without a yellow filter. The filter-less face will be recorded as an uninteresting, flat grey, while the face in the filtered picture will have a delicate texture, only matched by real skin.

To recap then. Generally speaking, if you want to lighten a colour in a black and white picture, use a filter of the same colour. To darken a tone, use a filter of a complementary colour. This chart will help you sort out which filter to use.

To lighten	Subject colour	To darken
Blue	Violet	Red or deep yellow
Blue or green	Blue	Red or deep yellow
Blue or green	Blue-green	Red
Green or yellow-green	Green	Red or blue
Yellow, orange or red	Yellow	Blue
Orange or red	Orange	Blue or green
Red	Red	Blue or green

Filters are divided into two categories, corrective and contrast. The corrective filters are the lighter colours – light, medium and deep yellow, light and medium green, and blue. The contrast filters are much deeper in colour. They are orange, red and dark green.

The contrast filters have a much more dramatic effect than corrective filters. You will be able to see the difference if you repeat the landscape photograph experiment. First photograph through a corrective filter, then through a contrast filter, and see what it does to the sky. In the final print, the contrast filter will have 'turned' the sky almost black. With white clouds literally standing out like large fluffs of cotton wool, the over-all effect is quite stunning.

Filter Factors

With the ability in filters to stop certain colours in white light, it follows that the general intensity is reduced and not so much light will reach the film. This can lead to underexposure unless you compensate.

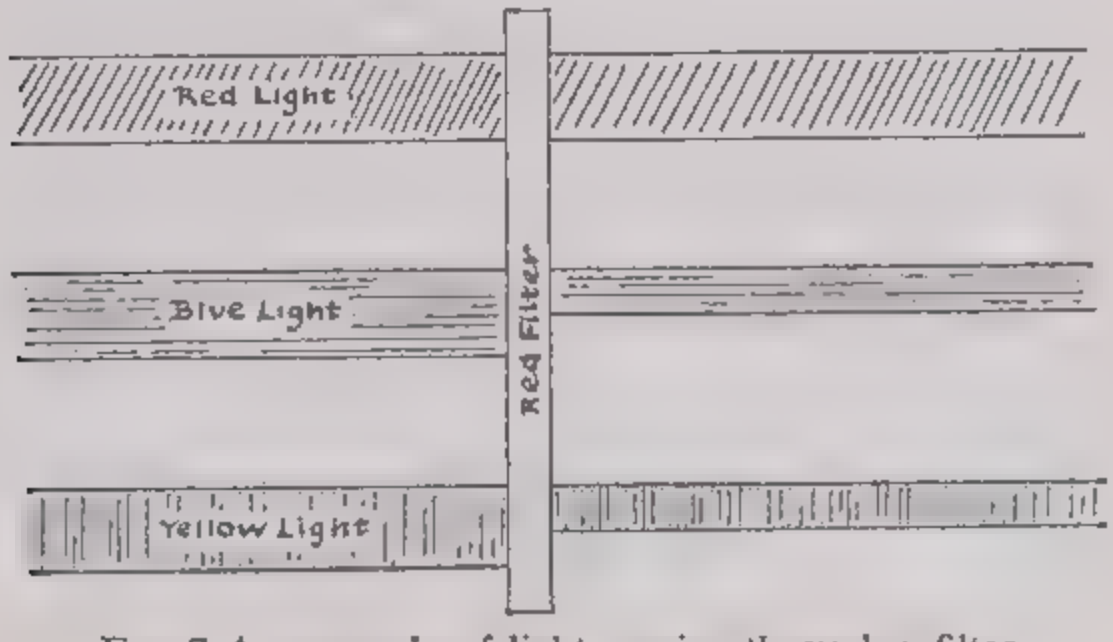


FIG. 7 An example of light passing through a filter

To assist us poor struggling photographers already burdened with f numbers, thousandths of seconds, and a host of other numbers, the manufacturers have made it easy to work out the light loss. They have given each filter a number indicating how much light is held back, and how much compensation you must give it. This number is called a filter factor.

A 2X (two times) filter factor means that you must allow twice as much light to enter. You will remember from reading chapter one, to increase the admission of light by two times you must open the aperture, or decrease the shutter speed by one stop.

For example, your exposure meter gives you a reading of f16 at 1/125 sec However, you want to use a medium yellow filter, which has a filter factor of 2X. You can either adjust the aperture to f11 or the shutter speed to 1/60 sec, depending on whether the depth of field is vital or a shutter speed necessary to stop movement.

Of course, not all filters have a 2X factor. You will see some with factors of 3X, 4X and even higher. The compensation must increase accordingly.

Take good care of your filters. They are as important to the photographer as the lens itself. You would shudder to think of a lens being thrown around, especially without a cover on, or rubbing it with a dirty tea towel to clean it, or abusing it in any other way. Handle your filters as you would your lens – with extreme care. Scratches on filter or lens surfaces will impair the quality of your pictures. Keep them in their cases for protection at all times when they are not in use.

Get the Lighting Right

Let us return to the subject of light, and in the process, obliterate a sacred cow. How many times have you been told by a well-meaning do-gooder to keep the sun behind you when you take pictures? Countless, no doubt. So you follow his advice, and what do you get? A photograph of a white faced, squinting model, her face contorted in an uncertain smile, looking for all the world like a living Ju-Ju mask.

Because of the flat lighting, the picture doesn't have any depth. There are no shadows to create the illusion. She might just as well have been a cardboard cut-out.

Have you seen such pictures? In your own files? Shame on you!

Never mind, if you follow the next few pointers you can say goodbye to all that. In fact, in a very short time you will be embarrassed by these early efforts, and you might even throw them away. At least you will probably hide them in a drawer, and not show them around And the people who posed for them will be delighted.

So much is spoken about lighting, that it is forgotten that shadows make the picture. Shadows give the subject in the two dimensional photograph an appearance of depth and create that touch of reality. Finally, any atmosphere present in the picture is as the result of shadows.

Now, if our well-meaning do-gooder is to be believed, you must stand with your back to the sun in order to get a photograph at all. But what happens? The shadows are all directly behind the subject. The only shadow you will see will be your own on the ground in front of you, if the sun is low enough.

But that isn't the shadow you want. To create the impression of depth and reality, you must have well placed shadows on her face. Not just any old ones splashed across her face, but a thoughtfully selected combination of light and shade to impress on the viewer a vivid appearance of depth.

You will learn this stage better by conducting yet another experiment. Begin by taking a series of photographs of a model in your garden. But, be warned. Pick a reasonable time of day. Take advice from Noel Coward and don't emulate the other 'mad dogs the Englishmen'. Stay out of the mid-day sun. Beaming down from directly overhead, the sun will produce Hollywood-type horror faces with black shadowy eye sockets, and the gaping shadow across the throat under the chin will create a passable impression of an almost severed head.

It will be best to wait until the sun is at an angle of some 45°. Such an angle will produce the best modelling to the face, and on any other subject for that matter. However, do not assume that you can only take photographs out of doors when the sun is at that precise angle. Some first class shots have been taken during early morning or late evening, when the sun is much lower.

But, to return to the experiment. With the sun at an approximate 45° angle, for the purpose of this exercise only, measure the exposure while following our well-meaning do-gooder's advice. Shoot with the sun directly behind you and blinding the model.

Then have your model make one eighth turn. Move the camera position until you are facing her, measure the exposure from the face and take your second picture.

Have your model take one eighth turn again, so that she is facing at right angles to her first position, and repeat the performance. Continue in this fashion until you have both turned a full circle, taking photographs all the way.

When you get the results, study them carefully. Remember you are looking for shadows and their effects. Never mind the posing at this stage, or trying to please your model. This is an experiment designed to help you get better photographs of her in the future.

Line all the prints up in front of you in the order you took them. Now, you do not need any explanation at all. The best prints will be obvious. Better shadow distribution in those which are lit from a horizontal as well as vertical 45° angle will give the startling three dimensional appearance you are after.

The best of the group should have a nose shadow which slopes down one side until the tip reaches the corner of the mouth. The shadow on the shaded part of the face meets this to form a highlighted triangle on the cheek farthest away from the sun. What is more, the model looks relaxed because she is no longer staring directly into the sun.

From the complete set of pictures you will discover some additional useful information. For instance the photograph which was taken in direct opposition to the instructions given by our well-meaning do-gooder has a certain, simple charm. The face, shadowed because your model had her back to the sun, is delicately toned, soft and flattering. Certainly worth repeating in future shots.

Study them all, and file the image of the most interesting shots away in your memory bank for the next session.

Experiment, Experiment . . .

This little exercise will give you an idea of the importance of well thought out lighting. You will learn a great deal more about outdoor portraiture later, so don't think that this is the end. As long as you try to remain detached and clinical about the findings, you will see that the applications you have just learned are equally as important for other subjects.

Try another exercise. Find an interesting building, one to which

you can return at any time of day and not be disturbed. In other words, don't choose one in a busy street.

Starting early in the morning, preferably just after it gets light in the winter, or at about 8 a.m. on a summer morning, set up your camera on a pre-selected spot. Measure the exposure and take your first photograph. Return to the same spot every two hours throughout the day, setting the camera up in the exact same spot each time, take careful exposure readings, and shoot.

Your set of results will enable you to make a direct comparison of the effects of lighting on an inanimate subject. Notice how the direction of the light at different times of day has an influence on the appearance of the building. It is an important point to consider whenever you want to photograph such a subject.

You can vary this experiment by returning to the same building, and repeating the exercise, but this time, shooting from different viewpoints on each visit. Try it with a landscape too. See the results for yourself and your learning will be much more complete.

The nett value of your experiments will be the realisation that a photograph of lasting value is one where light and shadow have 'breathed life' into the subject. Sometimes it means waiting around for the sun to transform a scene with its delicate fingers of light casting the shadows where you want them. You can't move a building or a landscape around like a model, so don't just shoot and walk away. Be prepared to return time and time again until you get the picture which will do the subject justice.

CHAPTER FIVE

Preparing your Camera and You for Creative Shooting

There is more to taking pictures than using a good camera, lens and exposure meter. Even measuring the exposure carefully is not enough. You must add yet another ingredient – you. If you forget all else (heaven forbid!), remember this one thing. Really great photographs are made by the cameraman, not by the equipment.

Of course, the camera and film do all the recording. But you, the photographer, create the final image. You study the scene, select the viewpoint, add those finishing touches and press the trigger.

What lifts a good photographer away from the average? How does he take that much better and exciting pictures? The answer to both questions is that he includes those small insignificant details which are missed by most. It is the little things that count.

You are going to learn about those details in this chapter. As you read the methods, remember to apply the golden rule practice until they become a habit. Make them an essential part of your technique so that you do not have to give them any thought when you are concentrating on shooting. You must have your conscious mind free to pay strict attention to the subject, and the composition itself.

An important point to remember is always use your own camera for serious photography. It doesn't matter how glamorous your neighbour's camera is, or how willing he is to lend it to you, leave it alone. You will find yourself spending so much time on finding and using the unfamiliar controls that you will not be able to concentrate on anything else.

Treat your own camera lovingly too. Despite its apparent robustness, it is a delicate instrument. Allow it to go to ruin and

your photographs will suffer. Check the working parts over each time you embark on an important photographic session. Test the shutter over the full range of speeds. See that the focusing is accurate and operates smoothly, and that the iris is in good working order.

Cleaning

When you are satisfied that the mechanical side is operating well, begin cleaning. Brush and blow out the interior before you load the film. Blower brushes are widely available in the photographic dealers and work well for this purpose. Better still, a rubber ear syringe will produce a stronger blowing action.

If you do use a brush for the interior, don't clean anything else with it, especially lenses and negatives. Mark it with a tape or something so that you are never in doubt. It is important to have a second brush for the lens Glass scratches easily and dust adhering to the grease transferred from the camera interior will make short work of even the most hardened lens surface.

Remember the three-fold lens cleaning process. Each one is a more drastic measure which should be used only if the previous one fails. Begin by blowing at the dust with a rubber ear syringe. Eight times out of ten, this will be enough. The surface dust will disappear.

Once in a while though, there will be some obstinate dust which refuses to budge. This is where a brush comes into action. Gently use your brush in short sweeps until all the dust has been removed, then use your blower again. You would be wise to get an anti-static brush for your lens. Even short sweeps with an ordinary brush on a lens surface will build up the static electricity and you will end up with more dust on the lens surface than before you started.

Finally there is the extreme measure to remove finger and grease marks. Naturally, you should avoid touching the lens surface if possible, but now and again you may inadvertently stick your thumb or finger on the glass.

When that happens you must be careful about its removal. No blower brush will do it, you will have to use a lens tissue or cloth. Start by carefully going through the first two steps to ensure all surface dust has been removed. If you use a tissue

with the dust still present, it is certain to scratch the lens. With the dust gone, breathe on the lens surface, and gently wipe it with the tissue, repeat this until the mark has gone.

After the glass is clear of all grease marks, use the rubber ear syringe once more to get rid of any dust adhering because of the newly generated static electricity.

Handling

Now, your camera is clean and loaded with film, ready to take pictures. The camera handbook will show you the techniques for handling the camera, so they need not be repeated here. That is with the exception of one which cannot be repeated often enough. Do not jab at the shutter release button.

It is easy to get careless at a moment of excitement Some action is breaking right in front of your eyes and, given the presence of mind, you take shot after shot. But, in your effort to get plenty of photographs in rapid succession, you jerk down hard on the shutter knob.

It won't do. Jabbing the button causes the entire camera to jog, presenting you with blurred pictures despite the use of a fast shutter speed. Some people even jab at the shutter release button when shooting under less pressing circumstances (no pun intended). They think they have to do it in order to make the shutter work!

Imagine you have a rifle in your hands If you jerk the trigger, you pull it off target. So, what do you do? You aim carefully and take up first pressure. When your are on target, you hold your breath, gently squeeze the trigger, and fire.

The procedure with a camera is identical. You will even find that the shutter release button has a 'first pressure'. If you practise these steps until you have perfected them, your photographs will be razor sharp, even if you have to shoot at relatively slow shutter speeds.

Camera holding methods play a big part in getting steady pictures. The eye level camera must be braced against the nose, cheekbone and eyebrow, providing a three-legged stand. Check your stance too. Stand solidly on both feet with your legs slightly apart and elbows tucked in to your sides. With all this going for you, you can't fail to get razor sharp pictures – unless you are suffering from chronic D.Ts.

Troubleshooting

Let's move on now, and work out what goes into a picture, and what is left out. There are basic rules, but the interpretation is an individual affair. Many a heated discussion has divided cameramen asunder at picture competitions, trying to decide the merits of this shot, and the merits of that shot.

Personal interpretation is a good thing, of course. It leaves room for individuality and this elusive thing called style. However, it does sometimes make it difficult for the newcomer to composition to cotton on.

But before even considering composition, there are a number of things you should watch out for in your picture making. They are generally classified as beginners' faults. But, they can be easily handled with a little thought. The trick is to prevent yourself from lapsing into making any of them from time to time.

Flare. You will remember that we discussed the position of the sun in the last chapter and how it was not necessary to have it positioned always at our backs. On the contrary, you will often want to photograph into the sun. The difficulty is that stray light catching the lens at an odd angle will cause flare on the film. The errant rays bounce about inside the lens barrel and flash the film making the image flat and lifeless.

To avoid this happening, you must have a lens hood in place for every shooting session. A professional photographer uses one all the time whatever the position or type of lighting, and he knows best. Even if the lens on your camera is deep set, get into the habit of fitting the hood. It will insure against forgetting when you are shooting through a filter. A filter brings the glass right to the front and will definitely need the protection of a hood. Without a hood on, a filter is a veritable conductor for any stray light that happens to be around.

Too crowded. A common beginners' fault is that they often try to get too much into their pictures. They feel the urge to get everything in the one photograph, perhaps on the assumption that it will save film. All they get for their trouble is a confusing photograph with no single centre of interest. Avoid this fault and you will see your pictures improve 100 per cent. Decide what you want to photograph, and leave everything else out. Do all that is necessary to eliminate unwanted objects. Get closer, change

your shooting angle, physically remove what is not necessary, if possible, in fact take any measure which will ensure there is nothing to distract the eye from the centre of interest.

Distracting background. It is easy to concentrate on the main subject and forget all about the background. Then, in the final picture you see your model has practically disappeared into a backdrop of messy detail, or she has a telegraph pole growing out of her head, or she has wings attached to her back which you thought were on the statue behind.

Pay attention to what is going on behind the subject. Position her with the backdrop in mind. If it isn't suitable then move the subject, or choose another viewpoint Once you press the button, it is too late, so get it right before.

Blank areas A puzzling phenomenon. For some reason one or two of your pictures have a blurred, blank space blocking out some of your painstakingly composed masterpiece. On careful scrutiny, it looks like some sort of object close to the camera. On even more careful scrutiny you discover that this blurred, blank space is the same shape as your finger. Check your camera holding technique. Change to one which will make sure you keep your fingers away from the front of the lens.

On the other hand, it may have been the camera case flap which caused the trouble, or even the strap. It is wise to remove the front of the ever-ready case completely before you take any pictures, and put the strap around your neck or wrist.

Using the strap properly is important for safety's sake anyway. There is just a chance that the camera may slip or be knocked out of your fingers. If the strap is hanging free . . . well, cameras don't bounce, you know.

Double exposure Even professionals fall for this one sometimes. However, establishing a picture taking routine will pactically eliminate it. Get into the habit of shooting, then winding on the film immediately afterwards. You will then know that your next action is to press the button, even if you have left the camera standing for some time.

Many modern cameras have a double exposure prevention device built in. It prevents you from taking a second shot before you have wound on the first, and you can't wind on before you have taken a shot. Whilst very useful for general photography, it

does cramp your style if you want to do something clever and deliberately take a double exposure.

Slanting horizon. Hold that camera straight. So many snapshots are found in family albums which show ships sliding down sloping horizons, off the edge of the picture. Check that the camera is level. Study the horizon before you shoot and make sure that it is truly horizontal. That is, if it is supposed to be.

Too close. A frequent occurrence from impatient budding portrait photographers. If your camera focusing ring indicates that three feet is the nearest you can get to your subject, it means that three feet is the nearest you can get to your subject. It doesn't mean one foot, or even six inches. Experiment if you like, but save yourself film and take it from me, you will only get a blurred picture. Now if you use a close-up lens . . .

Your camera handbook will probably tell you that you must not take a portrait at a distance any closer than five feet. Refusal to accept the advice will only get you photographs of clownish looking faces. Bulbous noses, prominent foreheads and chins and tiny ears are all characteristic. Is that what you want?

Don't be a photographic miser. Beginners never take enough photographs. It is a mistake. If you watch a professional at work, you will see him literally shoot dozens of photographs. He doesn't leave anything to chance. Film is relatively inexpensive in comparison with other photographic expenditures, and of course, the most important medium. It is the film which records the image. If you don't get a good shot in the first place, you are not going to get a good photograph.

Weigh the odds in your favour. Shoot plenty, changing your viewpoint all the time or having your subject alter her pose constantly. Then, when you get the resultant pictures, you will have plenty to choose from. You simply select the best.

Avoid large blank spaces. They do not look good in a photograph. Great 'deserts' in the foreground distract the eye and are magnified so much that the main subject practically disappears in comparison. It may be a lawn in the front of a house, or a beach, but whatever it is, find some way of 'breaking it up'. Try people, or shadows, better still, change the camera angle and cut it out altogether.

Too symmetrical. No photograph is less interesting than the one which has everthing in it evenly balanced. The figure slap-bang in

the middle, or the two buildings exactly the same distance from each edge of the picture should be avoided. Cómpose more thoughtfully. Place the figure on one side of the picture area, looking in towards the centre. Change your viewpoint when photographing the buildings so one is nearer the camera. Always look for ways of improving the appearance of the image in your viewfinder, before you press the button.

Basic composition

Symmetry is one of the elements of composition. There are certain rules laid down, which when obeyed, produce eye-catching results. Many modern photographers break these rules from time to time. But make no mistake, it is not because they haven't learned them. On the contrary, they probably have a good grounding in the rules, but feel the need to break them because the occasional shot would benefit with a variation on a theme. In short, they inject their own personality into the composition.

Before you can do that however, you must understand and practise the rules of formal composition. There are three basic principles:

1. Division of the picture area.
2. Balancing the picture.
3. Arranging picture elements.

1. Division of the picture area. The importance of not placing the subject dead centre of the picture area, spoken of a few paragraphs ago, will give you a clue. This indicates that the 'off centre' points in a picture are visually stronger than the centre area. In fact, it can be pinned down very precisely.

The picture area can be divided into thirds or fifths, horizontally and vertically. Subjects placed on any of these lines will be at the strongest visual position. It may be a building or a figure in a landscape on the vertical lines, or a line of hills, or a horizon on the horizontal lines.

The intersections of these lines are known as the strong points. It is at these positions that you can create the greatest visual impact.

2. Balancing the picture. Bearing in mind the principles of picture division, a photograph begins to feel right when the

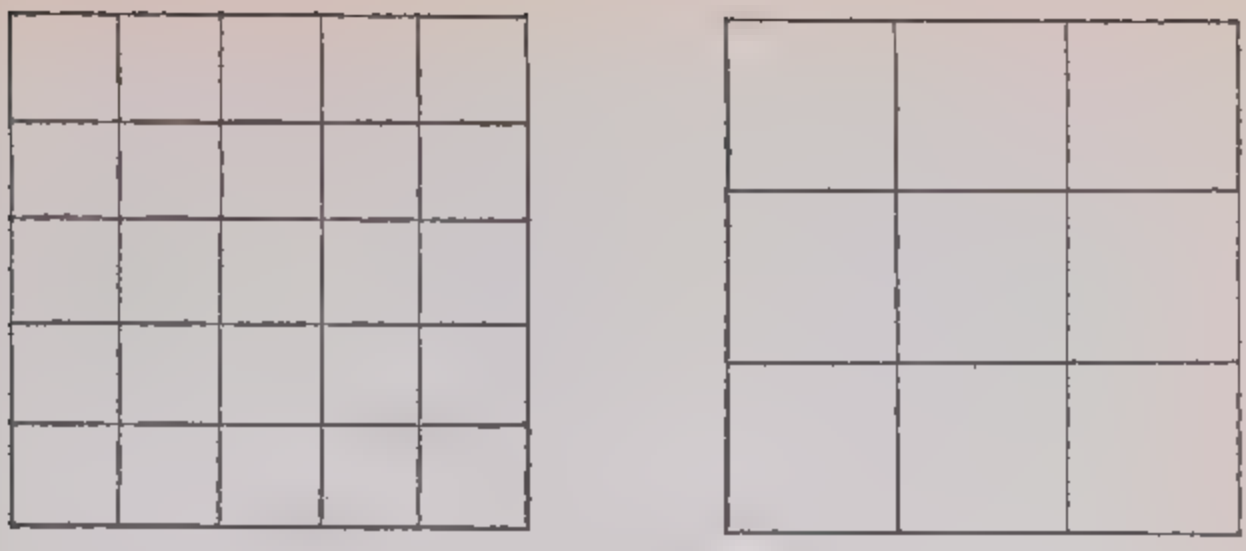


FIG. 8 Picture division

elements are balanced. This is not to say that you must revert to placing two objects of exactly the same size at exactly the same distance each side of the centre. The idea is to create some sort of balance with the elements of the composition whilst still avoiding symmetry.

For example, think of the principle of the lever. A large object near the fulcrum balances a smaller object near the end. The principle can be extended to photography. A large object or tone near the centre of the picture will balance a smaller object or tone near the edge.

This holds true whether the balance is being achieved vertically or horizontally. You can balance similar shaded or light and dark objects or tones side by side or one above the other, to get the effect you want. Watch the mood you are creating though. A large, dark object hovering over a smaller lighter one can, for instance, give an impression of impending doom. Be aware of feelings such as these.

Use the fulcrum concept and the strong points and you are beginning to get pictures with impact.

3. Arranging picture elements. When you have a group of objects to photograph, your problems are multiplied. You obviously have to place the important one in a prominent position, but the others must be so composed that they add rather than detract from the over all picture. It means forming the group into a pleasing arrangement.

The key is to re-focus your mind's eye and concentrate not on specific objects, but on masses. Form these masses into shapes or

arrangements which will create the desired feeling. For example, the diagonal suggests drama and action. Form your masses into a diagonal composition and the picture will vibrate with action.

The triangle shape is somewhat more static and solid. Masses formed into an oblong or square, if carefully done, give the suggestion of orderliness, and the circle or oval impresses on the viewer a feeling of serenity.

Lines, too, create impressions and lead your eye to what is important in the composition. Angular lines suggest action in much the same way as diagonal masses. Straighten them upright and they suggest quiet strength. Bend them as if they were blowing in the wind and you will express a feeling of movement. If they lie down they depict serenity or peacefulness, and only create the impression of a flowing movement if they take on a sinuous appearance.

Do you see what is happening? You are beginning to suggest mood and create impressions with your pictures Naturally, the subject should suit the arrangement to get the maximum mood impact It is no good trying to make something of the subject it is not. The whole thing will look contrived. But handle the subject carefully, and extract from it every ounce of the prevailing mood and you are sure to come up with a winner.

These basic comments on the elements of composition are just a beginning. The rest is up to you. Whole books have been written on the subject, but all the libraries in the world cannot compensate for personal experience. Practice, practice and still more practice, that is what will help you perfect your technique.

Apply these points to the study of the masters of photography and analyse what they have done to make you like the picture. More important, when you know how they have done it, copy them. Keep on doing it and you will be surprised how, in time, you will put the principles into action quite effortlessly in your future compositions.

CHAPTER SIX

Do-it-Yourself—Developing

Having made your careful exposure, you are now faced with getting a developed negative to match. After all, so far you have only done half the job. Now you want to see it through to completion.

If you give your film to your local chemist, he will send it to a processing station. It will be put through a series of baths together with all the other films, regardless of make, speed or exposure. A specialist will develop it differently. But even he will put it through the fastest developer he can. This is not to say that you will not get good work done by these people. You will. Your negative will be printable and, no doubt, you will get some more than adequate enlargements.

But will this satisfy you? I don't think so. You have struggled to perfect your exposure technique in order to produce the optimum negative. It seems natural to follow through and process your careful exposure. In fact you will only get your optimum negative by tailor-making the process from start to finish.

Remember that the quality of the final print begins with the quality of the negative. The production of a first-class negative depends on two things – the right exposure coupled with the right development.

I repeat, don't get me wrong about processing houses. They do a good job. You may wonder what all the fuss is about when you get your results back from them. Your negatives, because you have already improved your photographic technique will look better than ever. And so they will be. After all, among other things, your methods of exposure have improved too.

Nevertheless, if you do the job yourself, you will be able to exercise greater control over the outcome. With slight adjustment

to the developing times, you can increase or decrease contrast. By a careful selection of a developer you will be able to control the appearance of grain, emulsion speed, and so on.

More than that, you will feel the sense of satisfaction, knowing that it is all your own work. You can bask in the glory. Conversely, you have only yourself to blame if anything goes wrong.

Don't let the thought of processing your own films frighten you. It is not difficult at all. You only have to follow a few simple steps and the job is done. This really is a case where it is just as easily done as said. But before delving into the practical side of things, let's have a look at what goes on in a film when subjected to light and a developer.

The anatomy of development

As you know from earlier chapters, an emulsion is in reality, gelatine, with light sensitive silver halide crystals spread liberally throughout, and adhering to a base. It is the silver halides which form the image.

Light is reflected in varying intensities from different coloured objects As an example, a yellow object reflects considerably more light than one which is black. When the emulsion is exposed to these two objects, the section which will record the yellow object will receive much more light than the section recording the black object. The silver halides exposed to yellow will be subjected to greater activity, and when developed, will be more opaque than the other half.

When held up to the light, the finished negative looks opposite to the real thing. The tones are reversed. The darker or more opaque section is a reproduction of the lighter object and the area which is more transparent corresponds to the black object.

It all reverts back to normal, of course, during printing. The light passing through the negative is held back by the opaque sections, producing a light or whiter tone on the printing paper, and passed in greater intensity through the more transparent areas.

No one really knows what happens when a film is exposed to light. There is no need to go through the many theories on the subject. All that is known is the action of the light creates an invisible or latent image.

If you hold a piece of exposed but undeveloped film up to

the light, you would detect no visible change. It will have an identical appearance to its virginal state. However, the action of the light on the emulsion has caused a change to occur in the silver halides which allows the metallic silver to be released on development in quantities proportionate to the intensity of light.

Now we don't want a silver rush. Attempts so far to extract metallic silver from films have proved to be unviable. Also, don't expect to see lumps of glistening silver sprinkled liberally throughout the film. Silver in its natural state does not look at all like the way we are used to seeing it. It is black. The famous silver shine is the result of polishing.

The metallic silver is released in greater volume where the negative has been exposed to more light. Therefore, these sections will be opaque. Where the negative area has received only partial exposure, some of the silver halides remain intact, while the excess are washed away.

These exposed grains of metallic silver do not distribute themselves evenly through the emulsion. They tend to clump together in groups. When examined under a microscope or in big enlargements, these clumps become visible. On a print you will see them as speckles which may or may not be offensive, depending on the size of the enlargement, or the speed of the film. The faster the film, the more prominent the clumps. The common name for these groups of halides is'grain'.

If the developed negative were exposed to light at this stage, it would continue to blacken. It would finish up the same tone all over. The development must be halted and the image fixed so that the negative remains stable and can be exposed to light.

When bathed in a solution with a basic ingredient of sodium thiosulphate, the unexposed silver halides are washed away. With the light sensitive materials gone, the image stabilises. The chemical which performs this action is known as 'fixer'.

What you need to start

Enough of the theory Time to get on and discover how to process a film. First you must collect around you the necessary materials and equipment to make it possible.

To begin with, you will need a developing tank. Fortunately, modern photographic science has come up with a device which allows you to process a film from beginning to end in daylight.

The device is a light-tight tank. There is a hole in the top, light trapped of course, for pouring chemicals in and out. With a tank like this you can process films in your own living room while watching television.

The choice of a tank may be a difficult one. There are two basic types on the market. One is manufactured in a durable plastic, and the other in stainless steel. The latter is gaining in popularity, it being a relatively new innovation, mainly because it out-durables even the durable plastic models. However, in actual performance, there is little difference.

Where there is a difference though, is in the loading procedure. Each tank uses a spiral to hold the film. This is a special device which grips the film on both edges in channels which spiral in towards the centre of the tank. It is designed to keep the film surfaces apart to ensure the circulation of the chemicals to all surfaces of the emulsion.

To load the plastic spiral, which incidentally is the one process which must be performed in the dark for both tanks, you insert the film between the two spirals and rotate them in a 'sawing' motion until the film is completely loaded. A projection and a ball-bearing catches the film and advances it into spiral. Provided that you make sure that the spiral is dry and thoroughly clean, the film will load smoothly.

Stainless steel spirals are fixed. The two ends do not rotate at all. To load, you simply clip the end of the film on to the centre 'pole' of the spiral. With the aid of a special guide, you then rotate the entire unit allowing the edges of the film to settle in the channels. The appearance of the loaded film will be exactly the same in both spirals. But one has been loaded from the edge to the centre, and the other from the centre to the edge.

After this stage, the action is the same. You place the spiral in the tank and the lid is screwed or clipped on. Now your film is ready for developing.

Both types of tank are available for all sizes of film. However the plastic variety is adjustable and you can load films of 120, 220, 126, and 35 mm in the same tank – not all at once of course. You can buy a special tank for 35 mm films if you want to, but it has no distinct advantages over the universal tank other than it will take less chemical to cover the film.

You may feel that universality is a thing you can do without

right now. You are working in one format and that only requires one size tank. Fine, if you never intend to change. But should you 'gear' all your photographic equipment to one format – say 35 mm – and then, at a later date decide to change, you will have to start all over again.

The next item you will have to buy is a good thermometer The temperature of the chemicals is vital. In the old days when films were developed in an open tray in the darkroom, the processor could see what was happening to the image formation and adjust the developing time accordingly. He simply removed the film when the contrast and density was just right. At that time, knowing the temperature of the chemicals was not so critical.

Today, it is a different story. You have to develop 'in the dark'. The film will be in a closed tank and the only assurance you have is that the film was exposed correctly and the developer is at the right temperature. Only then will you know how long to keep the film in the developer.

There are thermometers made especially for photographic use. You will find a selection in your dealer's If you are uncertain which to buy, he will be happy to advise you.

Chemicals for processing

Choice of chemicals is important. The first one you should consider is the developer. The choice is so vast that to list them would be a formidable undertaking. However they can be broken down into two basic categories. There are those which can be used more than once, and those which can be used once only These are called 'one shot' developers.

Developers in both categories perform different tasks. There are developers for softening the grain, and developers for making it more crisp. Others increase negative contrast, or diminish it, or increase the emulsion speed, or slow it down, and so on. Most of them are available in powder or concentrated liquid form.

Begin by trying a 'one shot' developer. Those which can be used more than once tend to get exhausted after a while and become weaker, and this will have a marked effect on your film. With the 'one shot' type, you use it once at the correct temperature, for the correct amount of time, then throw it away.

However, if you are still bemused, you might begin with a developer against which all others are compared, while you are

sorting yourself out. Kodak's D76 has been around a long time and still compares favourably with other, more modern ones. You might even find that it suits your needs, or you may want to branch out to other makes in order to get the results you like.

Like all the other stages in your photographic progress, experiment first. You will not fully understand the action of a developer on a given film until you have experimented with it several times. Above all, avoid using an untested and untried developer on an important film.

Conversely, fixer will cause you much less difficulty. Like the developers, you can buy it in either powder or liquid form, but the choice is simplified in that all fixers are much the same in performance. You don't need to grow an ulcer over making a selection. The only thing you need to look for is whether a hardener has been included or not. Hardeners do tend to toughen the emulsion, affording it considerable protection against damage.

The final chemical to seek out is a wetting agent. Used in a pre-development bath, it ensures that the developer spreads quickly and evenly over the emulsion. Used in an after washing bath, it aids the film to dry evenly.

Some photographers wouldn't touch the stuff with a ten foot developing tank stirring rod, while others wouldn't be caught processing without it. You must make your own mind up about its benefits. Try it out and see how it works for you.

Other things you should buy to make your darkroom complete are a measure marked in ounces and cubic centimetres, a dropper and some large, dark bottles from your chemist.

Processing in practice

Now that you have gathered in all the materials to begin processing, it is time to go over the routine. Check first, that all your water and chemicals are at the same temperature. Developers work best at 68°F. (20°C.). You will need to bring all the other chemical baths to this temperature. If there is a delay between the baths arriving at the right temperature, and their being used, then stand them in a tray of water at 68°F.

Step 1. Assuming you have loaded the film in the tank, pour in your pre-developer wash. The liquid should be at a temperature of 68°F. or 20°C. It will be instrumental in bringing both the film and the tank to the correct temperature, ready for the

developer. Place the cap over the pouring hole and invert the tank two or three times to make sure that the solution is distributed evenly over the entire film surface. Then, remove the cap and pour the solution out.

Step 2. Check the chart provided by the manufacturers to see what the developing time should be at the standard temperature. Pour in the developer, rap the tank smartly on the table top two or three times to dislodge any air bubbles adhering to the emulsion. Then begin agitation.

It is necessary to keep the developer moving on the surface of the emulsion. Unless it is done, the developer quickly becomes exhausted in areas where the greatest activity is required – the sections which have received the most exposure, and having biggest number of silver halides to be separated or reduced. Agitation of the tank makes certain that fresh developer reaches areas regularly.

The best method of agitation, and in fact the only method with stainless steel tanks, is inversion. This means that you turn the entire tank upside down until all the developer has settled, then turn it back again so it is the right way up.

This action should be performed continuously for the first thirty seconds after the developer has been poured in and the tank has been rapped. Then you must invert the tank every sixty seconds thereafter until development is complete.

Step 3. When the time is up, pour out the developer and pour in water to wash off the excess chemicals. At this point you can use a stop bath if you feel it necessary. It is little more than a weak solution of acetic acid which halts the development process immediately. Plain wash or stop bath, agitate this intermediate bath continuously for for several times, then pour it out.

Step 4. In goes the fixing solution. It should be diluted according to instructions, and should be the same temperature as all the other baths. Agitate in exactly the same way as the developing stage.

Fixing solution lasts for some time, so don't throw it away after one use. When you have finished processing the film, pour it into one of the large bottles you bought from your chemist. Don't forget to mark it with the number of films it has fixed and the date it was made up.

Step 5. The wash. Your film should be washed in running water

for at least half an hour. If water from the tap is too cold, then you must soak the film in a large bowl of water, which is changed frequently, for one hour.

Step 6. A final rinse in water with wetting agent added, at the right temparature.

Step 7. Hang the film up to dry in a little used room. If there is too much activity in the room, dust will fly and for some reason or another, the film takes on the properties of fly paper. All the dust in the room seems to stick to the emulsion and is almost impossible to remove.

Step 8. When the film is thoroughly dry – that is at least twice as long as it has taken to apparently dry - cut it into strips and store it in specially designed negative envelopes.

There you have it. Developing is not so difficult after all, is it? On most occasions, it will be as smooth running as described here, but once in a while, things will not go quite right. There is very little you can do if things do go wrong, except learn from your mistakes. Here is a troubleshooting chart to aid you in discovering what caused the problem.

Fault	Cause
Thin negative with good shadow detail.	Short development, or the developer was too cold.
Negatives too dense over all.	Overexposure and over-development.
Thin negative with no detail in shadow areas.	Underexposure.
Flat negative with no contrast.	Developer too warm, or too vigorous, or overexposure.
Fogged negative.	Film exposed to light before development, or lens flare, or developer too warm.
Yellow fog (known as Dichroic fog).	Contaminated fixer, or lengthy immersion in exhausted developer.

Fault	Cause
Small, clear dots on film.	Dust on film before exposure.
Small black spots on film.	Undissolved particles of developer on the emulsion.
Dark, irregularly shaped patches.	Uneven drying.
Light irregularly shaped patches.	Developer did not work on film evenly because of insufficient liquid, or air bells on emulsion surface.
Crazy paving-type pattern.	Irregular temperatures between one bath and another.
Negative appears to be positive in some places.	Exposure to light half way through development.
Small, clear, round areas.	Fixer splashed on film before development.
Clear streamers below dense part of negative.	Insufficient agitation during development.
Milky appearance.	Incomplete fixing.
Crystals adhering to dried negative.	Insufficient final wash.

You can reduce or increase the density of a negative chemically in some circumstances. Chemical packs are available in photographic dealers for both of these processes. Full instructions for the use are supplied with the packs.

But remember, there is no way to intensify an under-exposed negative. Where there is no shadow detail, no amount of chemical action will produce them. The only real answer is to be more careful in the first place.

CHAPTER SEVEN

Do-it-Yourself—Printing

The magic of printing. To see the image appearing out of a plain piece of paper in the developer has an air of the magician's art. Even though you might see the process dozens of times, you will always feel the same way.

First you see the trace – the outline of the image. Then the shadow areas begin to fill and grow richer in tone. Finally, the detail appears in the highlights. At precisely the right stage, the image forming is stopped and fixed, and the 'magic' picture is brought out into the daylight.

There, in all its photographic glory is a reproduction of the scene you saw in front of your camera a short while ago. Your first print. You call all the members of the family together to have a look. They 'bill and coo' and tell you how marvellous it is, and you bask in the glory.

Having seen it once, the bug bites, hard. You have an overwhelming desire to get back for more. Every other stage has been hidden from your eyes. The exposure and the formation of the latent image, while invisible anyway, occurred in the camera. The development and the releasing of the image from its latent property the blossoming forth of the negative – occurred in the developing tank. But here, here in the darkroom, all is revealed.

There are those purists who say you shouldn't watch the image form. Those killjoys issue instructions that the paper should be developed face down. Take no notice. It doesn't make that much difference. If you have more than one print in the developer at a time, then it might be prudent to place them back to back. Otherwise, have the emulsion surface facing any way you want.

Prints as you know are produced on paper. It is light sensitive in its 'virgin' form in the same way that your film is. In fact, as a matter of interest, it is possible to coat a light sensitive emulsion on any flat surface. You will find such oddities as photographic glass, metal, cloth and a variety of other materials.

The important point to remember is that printing paper works in exactly the same way as a film. Expose it to light, develop, fix and wash, and voila! You have a positive reproduction of your negative.

Printing papers, like films, are available in different categories. The first has to do with speed, or exposure sensitivity. To begin with, there is Chloride paper which is used for contact printing, and is the least sensitive of the papers. The next is Bromide paper. This type is used for enlarging and has a much higher sensitivity. It is the fastest of the papers.

Finally, there is a mixture of the two. Chlorobromide has the characteristics of both the other papers and is used in enlarging for special work. Its speed is in between the two.

The second grouping is concerned with contrast. Papers are available in contrast grades Very Soft, Soft, Normal, Hard, and Very Hard. The names are self explanatory Contrast capabilities increase progressively from Very Soft to Very Hard. You select the paper grade to suit the negative. For instance, a flat negative will require a Hard or Very Hard paper to make up for the lack of contrast. Contrasty negatives should be printed on Soft or even Very Soft papers, and so on.

You will mostly be concerned with the three middle grades, and resort to the other two only in cases of emergency.

Printing paper is just as vulnerable to maltreatment as film. Because it appears to be more robust, it does not mean that you can treat it roughly. You should handle it with every bit of deference as you would a film. Keep your fingers off the emulsion surface. The only time paper should be removed from its box is when it is transferred to the printing frame for use.

When you are exposing it, remember that all the rules you have learned so far about film apply to paper too. Just because you can see the image appearing, you must not think you can control the density of the image by whisking the paper out of the developer when it looks about ready. That is a sure-fire method of getting sub standard images. Exposure and developing time

and temperature are just as important for papers as they are for film.

To Contact Print, or Not to . . .

The real question which arises now, is how the paper is exposed. There are two basic methods, contact printing and enlarging. Contact printing has been a favourite for years. It is losing ground now with the meteoric rise in popularity of the 35 mm format. A 1 in. by 1½ in. negative is too small for standard contact printing. But for larger negatives it is an inexpensive way to learn the ropes.

In a nutshell, you put the negative and the paper together, expose them to light, then process the paper. The denser, highlight areas hold back the light, while the thinner or shadow areas, pass it through easily. The result you get after development is an opposite to the negative – a same-size positive version of the scene you photographed a short while ago.

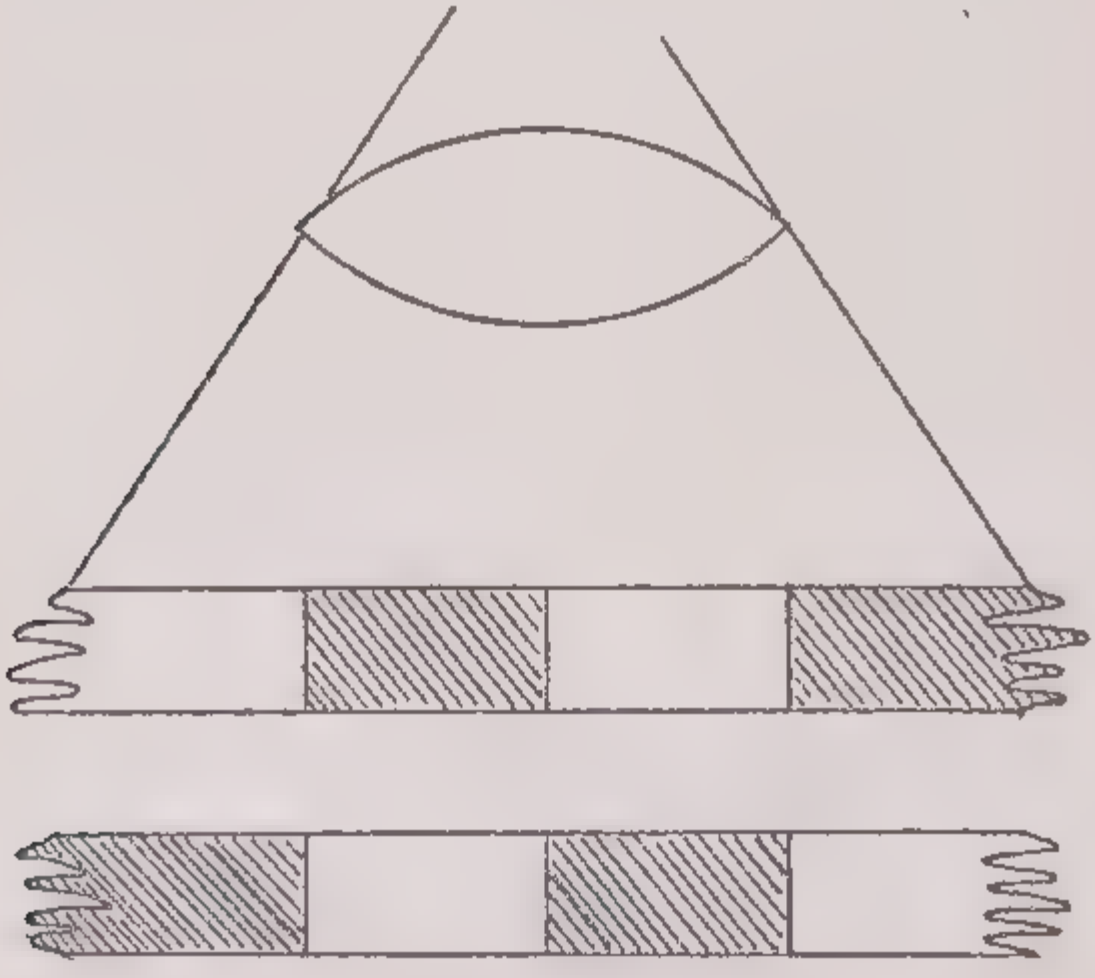


FIG. 9 Formation of a positive from a negative

Special devices are available for holding film and paper together in register and in all-over contact. Known as contact printers, they have a light in the base which is transmitted through a transluscent screen. The negative is placed on screen, emulsion side up, and the paper on top of that, emulsion side down. A special spring-loaded 'lid' is brought down on the two to keep them in contact, and a lever is pressed to unveil the light and expose the paper.

The contact printer is simplicity itself to use. It has started many photographers on the darkroom road. Contact printing requires so little preparation, you see. You can practically do it in your own front room. The slow speed of the Chloride contact printing paper means that a complete blackout is not really necessary. However, be warned that there is a limit to the amount of light that a paper can withstand without fogging. Too much light will ruin the forming image, no matter how slow the paper is.

The other method of printing, with which we shall concern ourselves in greater detail, is enlarging. Sooner or later, most serious-minded photographers begin enlarging.

It is not really much more complicated than contact printing. Apart from the initial expense, which is greater for enlargers, there is no reason at all why a newcomer to the art shouldn't start with this process right away. If you intend progressing in your photography, you will get one eventually anyway. So the initial saving made by buying a contact printer suddenly develops into an additional expense in your over-all capital outlay when you change over to enlarging.

Bear these thoughts in mind as you read this chapter and make up your mind which method would be the best for you to begin with. You will remember, of course, one of the consistent points made so far about buying equipment – to buy with future expansion in mind. Try to see over the immediate horizon and realise that as your knowledge and expertise develops, so will your horizons. If you find you have equipment which restricts you in any way, you will have to buy more.

In search of a room

Before you buy anything for printing though, you ought to check on the space you have available to set up a darkroom. Most ardent amateur photographers would love to have a permanent

darkroom, but you try getting your wife to release one. Most of us have to make do with an abandoned kitchen or the bathroom. Undignified though it might be, you will be but one of the thousands of photographers who started out, and in many cases still are performing their darkroom magic in the bathroom, perched on the most used seat in the house with the cover down and a cushion on the top for comfort.

Take a look around your house. Where else is more suitable? Your bathroom has running water, a vital asset. It has isolation. This makes the bathroom better than the kitchen in that it is less used, and, more imporant, it has a lock on the door. Many a carefully and painstakingly produced print in the kitchen has been ruined in the final stages by a thoughtless member of the family bursting in to make a cup of tea.

If you have a room to spare, you are fortunate. You can make a purpose-built darkroom. There are plenty of plans available, and if you are something of a do-it-yourself expert, you can make all the benches yourself.

But, you are in the minority. Everyone else will be envious of you, of course. However, don't think that because you are lucky enough to be in this position you can skimp over this chapter. While it specifically caters for the more nomadic darkroom magicians, you will find many principles which will apply to you.

There is no mystique about darkroom planning. All you need are two separate working surfaces – a dry one and a wet one. The latter bench should be near the running water. You will do all your messing about with the processing baths on the wet bench, and your enlarging on the dry bench. Keep them reasonably separated. Not so far that you have to walk between them. A darkroom is not the place for taking your exercises, or to exhaust yourself. Printing is a thing to be enjoyed.

Our bathroom squatter will have to content himself with a table in front of his 'seat' and a panel of wood across the bath. There you have your two working surfaces. The panel of wood on the bath is your wet bench, and the table your dry surface. You can then fill the bath with water and use it as the final wash.

Blackout is the most difficult problem in makeshift darkrooms. Your wife will just not appreciate a permanently darkened bathroom, nor will black curtains go with her décor. You will have to

make a temporary blackout device. Unfortunately they are notorious for their lack of blackout properties, and for preventing all air from getting into the room. A board of some sort is the only answer, preferably with a light trap built in that will allow air to pass through from the open window behind.

The board can be made to fit snugly in the window, although make sure it does not scratch the paintwork every time you put it up and remove it. There should be a flap all round which overlaps the window frame and fitted with felt padding or something else suitable for stopping light spill.

Two screws will hold it in place. To save the labour of screwing and unscrewing every time, drill a couple of holes and cut slots so that they slip over and hang in place on the screws. If the screws are small enough, you wife may not even notice them.

The bathroom has the added advantage of being relatively dust-free. That is important. Dust is your greatest enemy and you will be fighting it all through the photographic process. But, nowhere are you more vulnerable to its effects than in the darkroom Any dust on the negative will be enlarged along with the image. What were minute specs on the negative, invisible to the naked eye, suddenly take on the appearance of snow cascading down on the image subject.

Wage a constant war against dust during all stages of the photographic process. The effort will make sure you get clean photographs which require the minimum of after work to make them presentable.

Now that you have decided on the room where all the action is going to take place, let us have a look at what to put in it.

Buying an enlarger

The enlarger is first, of course It is, in reality, a vertical slide projector. The bulb housing, well ventilated to keep it cool, is positioned above the negative carrier. Light from the bulb projects the image of the negative through a lens and on to the baseboard.

There are certain refinements, naturally. First of all, even distribution of light is necessary over the entire negative area. This is achieved in one of two ways. Some enlargers are fitted with a translucent screen, which scatters the light rays from the bulb in much the same way a light meter does, only in reverse. Othere are fitted with a condenser which looks a lot like an outsize lens.

Condensers concentrate the light evenly over the negative area almost like a magnifying glass collecting and projecting the light from the sun.

You can see that the condenser produces a brighter image than the translucent screen. Exposures are achieved much more quickly and with an edge of sharpness not possible with the screen. Unfortunately, together with this sharpness, negative faults are accentuated. Dust becomes much more prominent, and scratches look like tramlines.

All these things, the bulb housing, condenser or screen, negative carrier and lens are mounted on a pole in one unit. It slides up and down the pole to allow you to get images of varying sizes. This, in turn, is mounted on a heavy base board, designed to balance the otherwise top-heavy instrument as well as provide a working surface.

There are certain characteristics about an enlarger you should watch out for when buying one. The quality of enlarger you get will be instrumental in making or breaking the quality of the final pictures. Check these points against the enlargers you are considering

1. Is it precision equipment? Having chosen your camera with care, don't ruin your work by using a shoddily made enlarger. This is especially the case when selecting a lens. If possible the enlarger lens should match your camera lens in quality.

2. Is it steady? Some poles on enlargers are so unsteady that a sharp print is only possible if no one in the household happens to be moving around and it is a still night. When looking at enlargers in the dealers, rack the head right to the top of the pole, and see how steady it is. You will also be able to see how stable it is, too. If it looks as though it is going to fall over backwards when the head is at the top – move on friend, move on.

3. Is it well ventilated? Enlargers do not have cooling fans so heat builds up quickly. Test it at the dealers. There should be provision for plenty of air to pass through Heat shouldn't build up so quickly that the negative gets hot and buckles.

4. Is it light tight? Sometimes the ventilation is so good, that when the bulb is switched on the enlarger lights up like a Christmas tree. The only light which should be emerging from the enlarger is through the lens.

5. Does the lens focus smoothly? There is no room for error when focusing with an enlarger. The fine focusing simply has to be spot on. Check it with a test negative and see how easy and smooth it is to focus. While you are at it, look at the apertures too. See what the range is, and make sure that when you operate the iris, the focusing doesn't move as well

6. Are all the controls accessible? Position yourself in front of the enlarger as if you were going to use it and see how easy it is to reach all the controls. There should also be an on/off switch on the cable.

7. Is the column high enough? It should be at least two feet high, and you should be able to swing the head around 360 degrees for projection on the floor for giant enlargements. Also, the head should pivot to allow horizontal projection on to a wall.

8. Does the carrier hold the negative properly? It must hold the negative flat, and be easy to clean. Glass is sometimes used to keep the negative flat, but when all these surfaces come together, it is extremely difficult to eliminate dust.

9. Is it the format you want? If you are a 35 mm fan, should you buy an enlarger which is suitable for 35 mm only? There is no doubt that a 35 mm enlarger is certainly ideal for 35 mm negatives. You will get optimum results, provided the enlarger is good in every other way. The trouble is, you are limited. Should you ever buy a 120 camera as a second, you will have to buy another enlarger too. But, an enlarger which will handle 120 films will also take 35 mm. Perhaps this would be a better format to go for. Like the developing tank, these enlargers are called 'Universal'. Think about this point carefully before you buy.

All the things you need

Having chosen your enlarger, you now need to look at safelights. These allow you to see in the darkroom without exposing the paper. You can buy them in a variety of colours, and in different shapes and sizes. Choose one within your price range which is also safe. Generally green is the colour used with bromide papers, but you will find that orange or red will do the job just as well.

Check it as soon as you get it home. In the darkroom switch on the safelight only in the presence of some bromide paper with a coin lying on the top Leave it there for a few minutes, then develop the paper. If it remains white all over, the safelight is

safe, but if the paper takes on a definite tone except where the coin was, then return the light and ask for another.

The next purchase will be at least three different coloured trays. One for developer, one for an intermediate wash or stop bath, and the other for fixer. The colours provide a simple means of identifying which tray is used for which chemical. Should you ever mix them up and put developer in the fixer tray, there is a strong danger of contamination.

If you are a bathroom squatter, the bath will do for giving your prints a final wash. The fortunate darkroom magician with a permanent arrangement, or you who have to use a room other than the bathroom, will have to find a large tray or bowl for this purpose.

The three chemical trays should be at least 10 in. x 8 in. This size may seem ridiculous if you are are starting out enlarging half plate (4¾ in. x 6½ in.) prints, but have no fear, you will soon grow to using bigger sizes. They should be deep enough to allow you to pour in plenty of developer and not be in danger of spilling it over your feet. There should also be a pouring lip in one corner.

To prevent your having to touch the paper during processing, and in order to keep your fingers as dry as possible, you will need some print tongs. Buy strong ones, you want them to last a long time. See that the tips are not so rough that they will scrach the prints. You will need two pairs, one for each chemical – the developer and the fixer. You can buy them in different colours, so get them to match your trays – again to avoid the possibility of contamination. If you can't get them the same colour as the trays, then mark them with a piece of tape.

A couple of funnels will make the pouring of chemicals a much less distressing task. It is surprising how difficult it is to transfer the contents of a tray to a bottle without a funnel. Most of it seems to end up in a puddle on the floor.

Timing is important in the darkroom. You can use the second hand on your watch, but it is not the easiest thing to see under a safelight. In that case a darkroom clock will help you avoid eyestrain. They are in effect, alarm clocks, but they 'tick' off seconds instead of minutes and hours. They aren't very expensive, and one will make a very useful accessory for developing and printing.

The chemicals necessary for the darkroom are:

1. Developer.
2. Stop Bath (Optional).
3. Fixer.

You can use the same type of fixer for papers that you did for films. Notice that is the same 'type', not the same fixer. Split the contents of the fixer bottle in half, and dilute one for films and one for papers.

Your stop bath, should you decide to use one, is little more than a dilute solution of acetic acid. Ask your photographic dealer for a stop bath. If he doesn't have one buy some acetic acid from your chemists and make up a 2–5 per cent solution. This bath does have the advantage of stopping development immediately as well as neutralising the developer. However, inasmuch as the very slight continued development, which occurs in water if it is used as an intermediate wash, doesn't matter all that much, the only real advantage it has is to diminish the possibility of contamination. The developer being neutralised will not be carried over to the fixer.

But what of the developer? As in the case of developers for films, these, too, are vast in number. There are different developers for doing different jobs. When it is all boiled down to basics though, we find that the choice is between a developer which gives rich, warm tones, and one which gives you prints with rich, blue-black tones. A question of taste really.

To begin with, resort again to Kodak, and try their D163. You can buy it in either powder or concentrated liquid form. Then, when you have thoroughly mastered the basic principles of enlarging and processing papers, you can begin to experiment with different developers, to find one which suits your taste.

The paper may cause you some confusion too. There are many different sizes, many different grades and many different surfaces. The first problem is easily overcome. Buy them all the same size. Standardise on 10 in. x 8 in. It has one big advantage in that it can be cut down to logical sizes. It is also easy on the pocket to standardise. You do not have to go to the expense of buying the same type of paper in different sizes.

Problem number two is not so difficult either. If you have taken any notice of the information given you in earlier chapters, you will be exposing and developing the film to produce a normal

negative. It will have good gradation and contrast. This type of negative will print on normal paper. Keep this up and the bulk of your negatives will print well on a normal grade, so you need only lay in a box of 100 normal grade 10 in. x 8 in., and in case of emergencies, packs of 10 soft grade and hard grade papers.

That leaves the choice of surface. Do you buy matt, or semi matt, silk, glossy, or any one of a dozen other types? This is something which is difficult to advise on, because it is a matter of personal taste. Subject content does have some bearing as well though. For instance, most portraits are printed on a fine lustre or matt paper. Pictures for publication should always be glossy, the editor will not be really interested in anything else.

Have a look at the different surfaces. Your dealer will have a book of photographs all printed on different surfaces, much like a wallpaper book. Ask to see it and you will be able to make your selection from examples.

Finally you need something to hold the paper flat when you are actually enlarging. The most suitable device is a masking frame. This is a hinged frame with two static edges and two movable edges, enabling you to get borders on any size prints. The maximum size paper you can use will depend on the size of the frame, so think big when you buy. Get one at least 10 in. x 8 in.

To the darkroom

Gather everything together, including your thermometer, and set up your darkroom. When you have locked yourself in the blacked out room, just sit still and let your eyes adjust to the dark. You will then be able to see if there are any dangerous chinks of light which may fog the paper.

Begin the printing process by cleaning the negative. Your rubber ear syringe will come in useful here. Handle the negative by the edges at all times and only touch the surface with an anti-static brush. You can clean off fingerprints with an anti-static fluid. Be careful with it though it is dangerous and should not be inhaled.

It goes without saying that you should check to see if the lens is clean. Dust and fingerprints will cut down the light transmission considerably, as well as scatter it, and will impair the image quality in the final photograph. Follow the routine already

established for cleaning a camera lens, and extend it to the negative carrier, if it has glass in, and the condenser.

With the negative in place, focus on the baseboard. A simple process, you might say, but there is so little room for maneouvrability, that you have to be extra careful. In fact, to make certain that your final picture isn't even paper thickness off, it is advisable to focus on a spare piece of unused bromide in the masking frame.

Always focus at full aperture, and concentrate on the grain. There are special magnifiers which 'blow up' a section of the image in the viewfinder to such a proportion that the grain is clearly visible. Don't think that a focusing aid is necessary, you will manage perfectly well without one. However, it is a useful item to add to your 'future buys' list.

When you are satisfied that the image is sharp, stop the aperture down to the 'optimum' position. Remember no lens works at its best at full aperture. It tends to soften the image. The optimum aperture is two or three stops down from maximum.

Your next problem is how to decide on exposure. It can't be done with an exposure meter, you will have to find it out 'by hand'. Fortunately, the job is simplified by the fact that you only have to discover the time. You already have the aperture.

There is an age-old method, which has been tried and tested, and is still practised in an incredibly large number of amateur and professional darkrooms. Despite the electronic age we live in, the test strip is still the king Nothing more sure has been discovered so far.

You need a piece of card which is big enough to cover the entire print Start by exposing the paper all over for two seconds Then, working in two-second 'jumps', expose first by covering a one-inch strip of the paper with the card. Next, slide the card over so it is covering an additional one-inch strip, making two inches in all, and expose for a further two seconds. Continue covering the paper in successive one-inch/two-second phases until the entire paper is protected by the card.

If there were ten moves altogether, you will have a piece of bromide with a two-second exposure at one end and a twenty-second exposure at the other.

Develop the paper normally. The print will show the different exposures in progressively denser strips. Fix it, then put it

through a preliminary wash, and finally, view it under normal room light.

The strip which has received the correct exposure for the negative will be obvious. The tones will range through from rich blacks to base white. Detail will be recorded in all the important areas. Defining the right exposure when you have found the strip is only then a matter of counting the sections up to your chosen one. For example, if it is the fourth from lowest exposure (the lightest strip) then the exposure of the final print will be eight seconds.

Test strips can be vertical, horizontal or diagonal. It does not depend on the mood of the moment, you adjust the direction to make sure each strip shows the maximum range of tones. If you are 'test stripping' a landscape, it would be useless to make horizontal strips. The top sections would be all sky and you will not be able to get any idea about the correct exposure of the land itself from that. Make the strips vertically, however, and each will then take in a complete range of tones from the bright sky to the darkest shadow.

There are devices around which simplify the job of measuring the exposure during enlarging. The simplest is a transparent film made by Kodak on which is printed a variety of measured densities. All you have to do is place this film on top of the paper and flash them both with light through the negative for 60 seconds. Then you develop the paper in the normal way. You will of course, see a reproduction of the exposure calculator printed on the paper, but the measured densities will have held back the light. Check the portions until you find which one has a good range of tones. Marked beside each section is a number which corresponds to seconds. The number beside your chosen segment will be the correct exposure to give the final print.

Also available are electronic devices which operate in a similar way to exposure meters. You position the cell under the light transmitted through the negative and the meter tells you how many seconds are required. Some of the more sophisticated models will operate the switch too, illuminating the enlarging lamp for just the right number of seconds, then switching off.

Timing in the darkroom must be accurate. Counting of 'one thousand and one, one thousand and two' and so on, is just

not precise enough. You can certainly count in this way in an emergency, but the bulk of your timing should be performed with a darkroom clock, or at least the second hand on your watch, in order to get consistent results. Only a mechanical device will turn out exactly the same results time and time again.

Developing the paper

The mechanics of processing paper is identical to film developing. Even though you can see the development taking place, the temperature, and the time the paper is in the developer should be strictly controlled.

At 68°F. you will probably find that the exposed paper will develop in about two minutes. All your exposures should be worked out on the basis of this time and temperature. If you under- or overexpose, start again. Under- or overdevelopment to compensate will not help. The quality of the print will be far from excellent, and you should never be satisfied with second best.

Slip the print into the developer and keep it moving. If you don't keep the developer in motion, air bells may form on the surface of the print and you will get uneven patches of underdevelopment. The best method of agitation is to rock the dish, causing waves to wash across the surface of the print.

After two minutes, progress the print through the stop bath (or intermediate wash), the fixer and the final wash, using the same agitation methods throughout. Do not be satisfied with viewing the final product under the safelight. Either switch on the white light (making sure the unexposed printing paper is covered), or take it outside to view. You will be surprised how different it looks. It will be lighter for a start, and all the blemishes suddenly reveal themselves. Above all, if you discover that you have not made a perfect print, be prepared to make another.

Finally, we come to the drying stage. To dry cleanly and properly, your prints should have been washed for at least half an hour for single weight papers, and one hour for double weight papers. The most basic drying method is to lay the prints out, emulsion side up on newspapers Soak up the excess water collected on the face with lintless blotting paper. You could invest in a print roller. It performs the function of blotting paper, except you roll the water off.

An electric dryer/glazer is something which should be on your 'future buys' list. These heat-dry the prints, and instead of taking all night to dry, the job is done in a few minutes. You lay the prints emulsion side down on the glazing plate, excess water is squeegeed off, and the canvas sheet is clipped into place to keep the paper flat against the drying surface. As the dryer heats up, so the prints dry.

The electric dryer/glazer is something which should come high on your list of priorities if you want to produce professional looking photographs.

Cropping in the enlarger, and other techniques

It is not always necessary to enlarge the entire negative area. In fact you will find that it is a very rare occurrence. You will often have to select only a portion of the negative.

Initial composition in the camera usually tends to be somewhat generous, and a number of unwanted details could well disappear in the printing stage. Even more important, you may find that by judicious selection you can extract more than one picture from one negative. In short, composition does not necessarily stop at the shooting stage. However, it should not be used as an excuse for sloppy photography.

To improve the composition of any picture, progress it through these three steps:

1. Print the entire negative area on a 10 in. x 8 in. sheet of paper, then process wash and dry it in the normal way.
2. Now you can compose at your leisure. Cut out a pair of 'L' shaped pieces of cardboard and form them into a frame. The fact that they are infinitely adjustable means that you can create any size and shape to mask the picture. When you are satisfied with the composition, hold the 'L's' down firmly and draw a line around the inside.
3. Reprint, using the guide line around the composition on the master print as your template.

During the study of the composition, you may notice one or two imperfections in the image. One area may be too light. But to give the entire print extra exposure would only serve to darken it too much. Another area may be too dark. You can't adjust the exposure of the entire print for the sake of one area in this case either.

Localised adjustment would do the trick, of course. The methods to do this are called 'burning in' and 'dodging'. To burn an area in, you need a sheet of cardboard with a hole cut to approximately the same shape as the offending area. When the normal exposure of the entire print is complete, position the cardboard between the lens and the baseboard and switch the enlarger on again. Allow the light to pass through the hole, only over the area which requires extra exposure.

Keep the cardboard moving so that you do not get the sharp edges of the hole reproduced on the final print. Just a slight vibration will do.

It may be possible to use your hands instead of cardboard. Act out a rehearsal first with the light on, but with the safelight in position. That way you can make sure your hands cover the entire print except where you want it burned in.

You use dodging to produce the opposite effect. You must hold back the light from a certain area of the print during the exposure. Cardboard again comes into play as the medium for local control. Cut out small pieces about the shape of the area to be dodged. Attach them to some wire and hold it in between the light and the paper, moving it about slightly to prevent hard edges forming.

Again, it is possible to use your hands, but in this case more difficult. If the area is very large, you will be able to manage with your hands, or if it is close to the edge of the picture.

Aftercare and troubleshooting

When you have your final print, all beautifully composed and well exposed, with small sections burned in and dodged, you may find that there is still work to do. Some of the dust you worked so hard to eliminate is still visible on the prints as small white dots. The more you look at them, the more prominent they seem to become. Having done all you can in the darkroom, all you can do now is paint them out.

To do this, you use 'spotting fluid', a small bottle of which you will be able to buy for a few pence. In its 'virgin' form, Spotting Fluid is black. You simply dilute a few drops of it with water to the shade of grey which corresponds to the tone where the spots are on the print. Then, testing it on a spare duplicate print first

to see the grey matches perfectly, gently touch out the white spot. Use short, dabbing motions, as you would when stencilling. Take your time. Patience is definitely a virtue for successful spotting.

Continue in the same way to eliminate the remainder of the dust spots until you have a clean print. Dilute the fluid to different strengths according to the shade of grey required. Initially you will have to try several times until you get it right. But, before long, you will be spotting accurately and quickly.

It is all a part of being determined to present only your best work. Throw away everything else. If you insist on keeping your less than best efforts, you will feel the need to justify your mistakes every time someone sees them, and that can be embarrassing.

As with films, all sorts of peculiar things can happen to printing papers. It is a simple matter to throw away a print which has unusual marks and blemishes on it, but not so easy to define what they were caused by. You have learned how to troubleshoot your negatives, now let's have a look at what can go wrong with your prints.

Fault	Cause
Too contrasty.	Underexposure and overdevelopment, or paper grade too hard.
Too flat.	Developer exhausted or too much dilution, or paper grade too soft, or exposure or development cut short.
Fading image.	Insufficient fixing, or overexposed and underdevelop.
Grey fog.	Unsafe safelight, or development too long, or aged paper.
White spots and patches.	Fixer splashed on emulsion before processing, or air bell formation when first put in developer and not kept moving, or dust on film and/or carrier glasses.

Fault	Cause
Black spots and patches.	Developer splashed on emulsion before processing, or fingermarks during development, or undissolved chemical particles in developer.
Spots and marks in patches.	Print not immediately covered completely by developer, or development cut short on over-exposed print.
Blisters on surface.	Fixer too concentrated, or variations in temperatures between chemicals.

There is nothing more satisfying than seeing the final print and knowing that it is all your own work. You can exercise strict control over the appearance of the end product, and this is just one more stage towards imposing your own personality on your work – one more step nearer a personal style.

CHAPTER EIGHT

Colour in Camera

Before looking at the aspects of practical photography, you would profit by gaining an understanding of colour and its uses. While most of the applications you will learn in the following chapters are good for colour and monochrome, the approach to colour photography is slightly different. It is like putting the icing on a cake. The entire appearance of the cake is altered.

In point of fact, the number of colour pictures taken in this country surpasses black and white. The advent of the inexpensive cartridge load camera encouraged the 'millions' to use colour and ensured its future expansion.

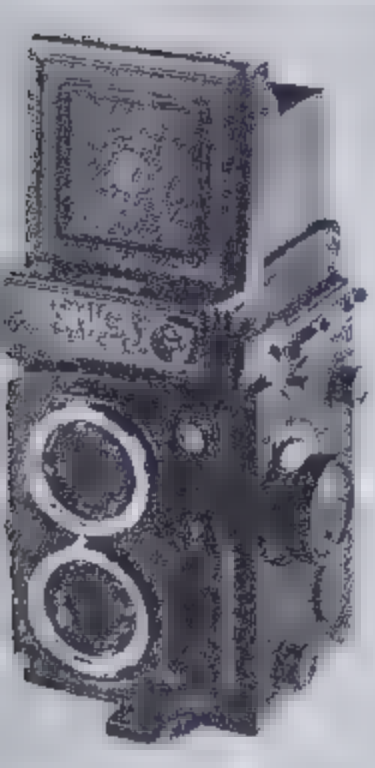
At one time, when you bought a camera, it was necessary to ask whether it was all right for colour. Not so now. Manufacturers are making cameras with colour firmly in mind. So, unless you have a vintage camera, rest assured that you can use colour in it. Really, the emphasis has altered. Instead of asking 'Can I use colour?', you now ask 'How do I use colour?'

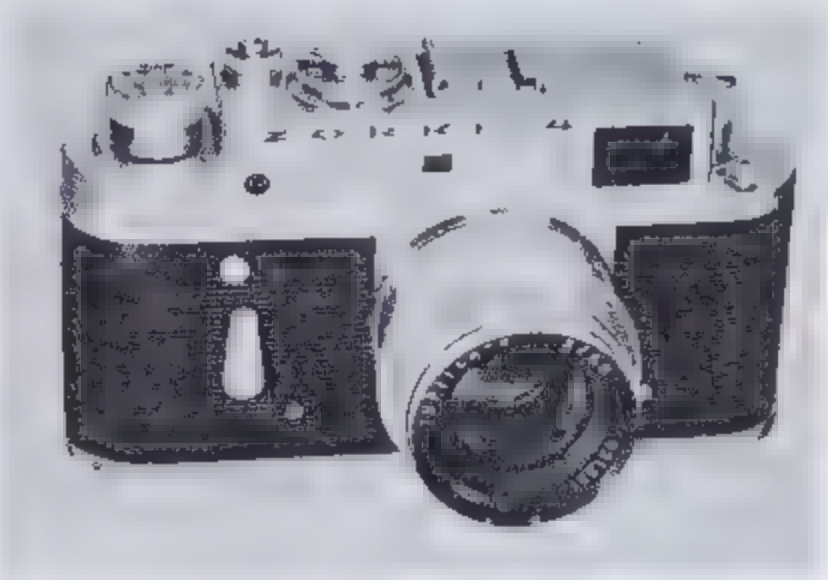
You will appreciate the full value of colour film if you know what goes into making a film. Do you remember that black and white films are little more than a minutely thin silver halide saturated emulsion coated on a base? Well, colour film isn't all that different. It too has a base coated with emulsion, only this time there are four layers!

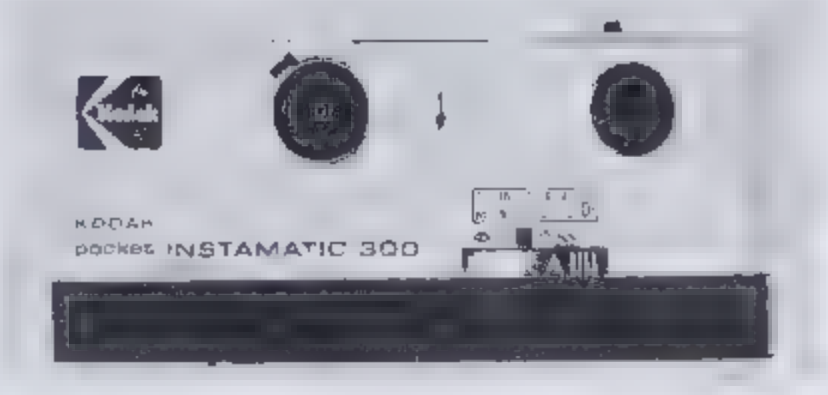
Cast your mind back to our discussion on the primary and complementary colours. You will remember that the primaries are red, blue and green. These three colours are the basis of the formation of all the colours in the spectrum. By coating a film base three emulsions, sensitive to the three primary colours, the film is able to record all the spectral colours.

CAMERAS
(not to scale)

ove: Single lens reflex. *Right:* ngefinder camera *Below:* ın lens reflex





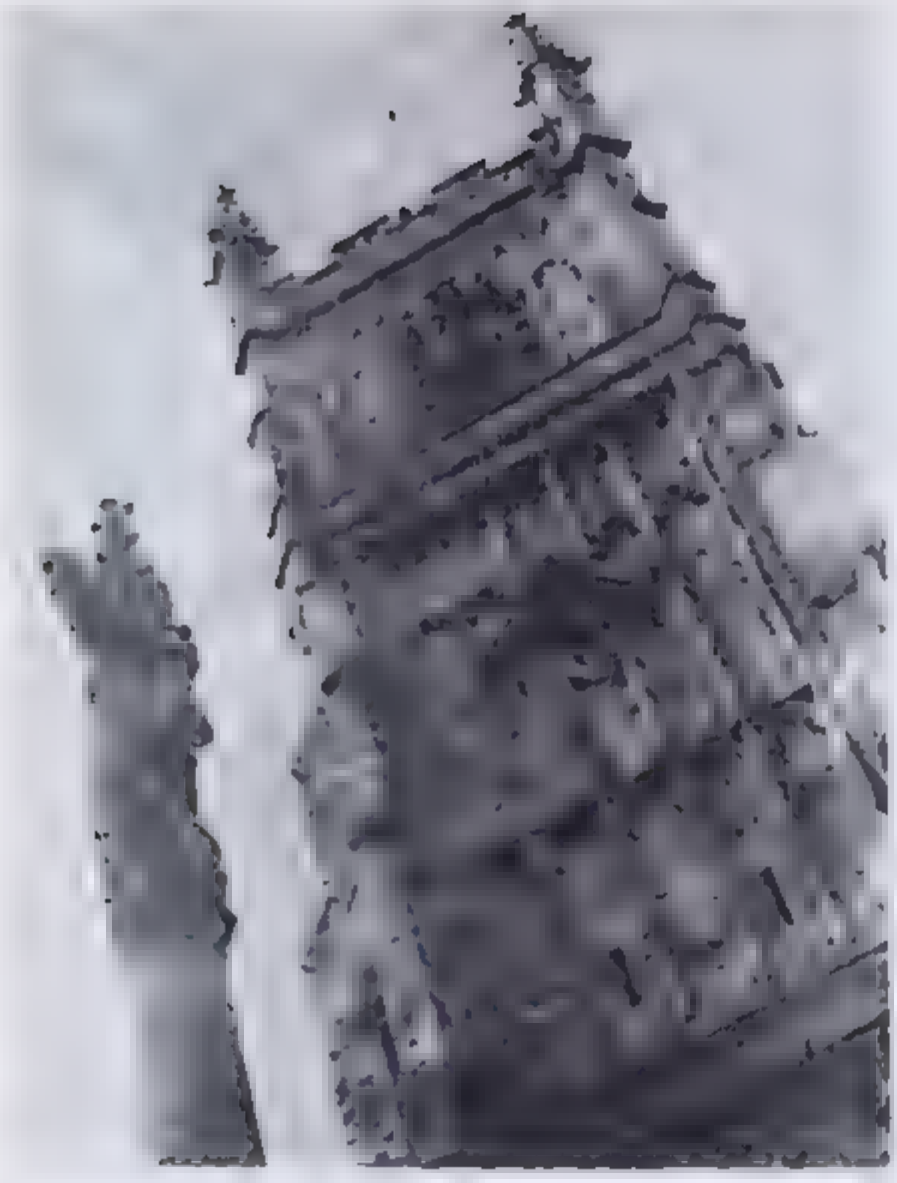


Above: Kodak Pocket 'Instamatic 300'. *Left:* Sub miniature camera

Use of the hyperfocal distance technique for added depth of field. Topcon PR Kodak Tri-X, f 16 at 1/125 sec

When photographing your relations, fit them into the composition naturally. Topcon PR. Adox KB 17. f 11 at 1 125 sec.

Including objects in the foreground gives an impression of depth. Topcon PR. Adox KB 17. f 22 at 1 60 sec.



Accentuate converg ng verticles by getting in clo to the base of a building and pointing the camera upwards. Topcon PR Kodak Tri-X f 11 at 1 6

[illegible] picture when on holiday. Topcon PR, Adox KB 1 f 16 at 1 125 sec

For candid shots, look for people doing unusual things. Topcon PR, Kodak Tri-X, f 8 at 1 60 sec

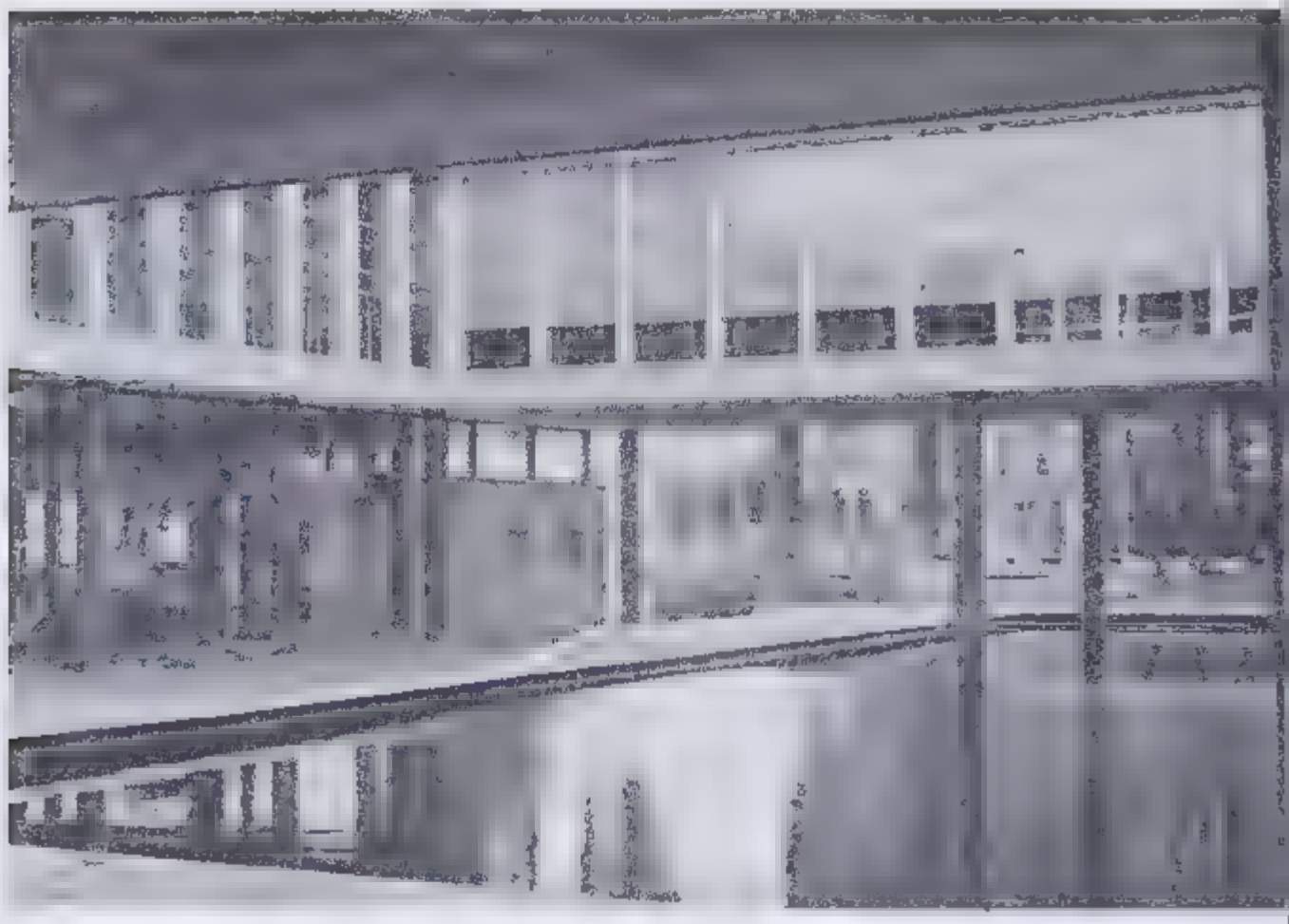
Go out to where children play to shoot them in action. Topcon PR, Kodak Tri-X, f 16 at 1,125 sec

PR Kodak Plus-X f 5 6 at 1/30 sec

ast film gives freedom to shoot in available light with plenty of depth of field. Topcon R, Kodak Tri-X, f 8 at 1/30 sec.

Shooting with available light helps to maintain atmosphere. Yashica 635. Kodak Plus-X. f 11 at 1/125 sec. (*a Save the Children Fund picture*)

Familiar buildings take on a completely new look at night. Yashica 635, Adox KB 21 3 s at 1/30 sec



Reflections in water may inflate exposure reading if avoiding action is not taken. Yashica 635, Kodak Plus-X, f 11 at 1 125 sec.

When shooting into the light, allow the subject to become a silhouette for an unusual result. Topcon PR, Kodak Tri-X, f 4 at 1 250 sec.

Plus-X, f 5 6 at 1/30 sec. (*a Save the Children Fund picture*)

Pick out the important part of the subject with selective focusing. Yashica 635, Kodak Tri-X f 16 at 1 60 sec

Hold your camera lens ver and they will be so out of focus that they
. Kodak Pl -X, f 8 at 1 125 sec

Position your lights so th
the subject appears to be
illuminated by only one
source. Yashica 635
Panatomic X. f 4 at 1 60
sec

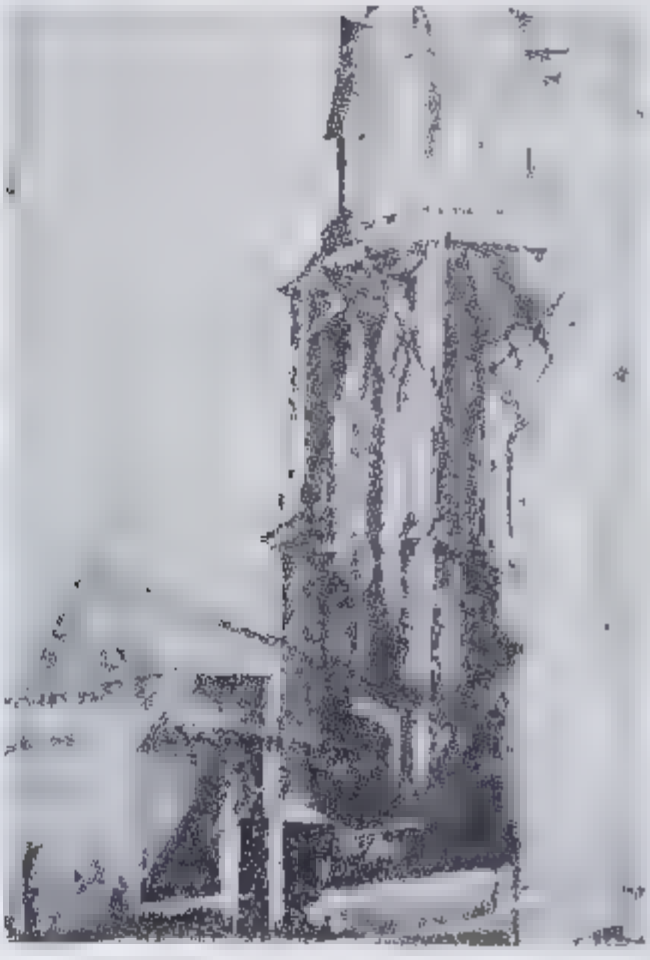
Excessive contrast caused
by window light can be
reduced by a reflector
Topcon PR. Adox KB 1
f 2.8 at 1 30 sec

Selective focusing subdues background and gives a three dimensional appearance. Yashica 635. Kodak Plus-X. f 4 at 1 60 sec

Close-up lenses can be used for the face, but only for babies and preferably in profile. Yashica 635. Adox KB 14 f 4 at 1/30 sec. No. 1 close-up lens

Grain becomes obvious in giant enlargements, and can be used to create a special effect. Baldamatic. Ilford HP.3 f 4 at 1 30 sec

Below left: Still life can take many forms. Yashica 635. Kodak Plus-X. f 4 at 1/30 sec /*Below:* Even lighting is important for copying. Yashica 635. Kodak Plus-X. f 4 at 1 60 sec



However, there is one snag. All film is sensitive to ultra-violet and the blue end of the spectrum. Colour film is no exception. To counteract this a filter layer is included between two of the colour-sensitive emulsions. In keeping with the rules learned for subduing ultra-violet and blue, the layer is yellow.

Even that is not sufficient to control all over reaction to blue though. An additional filter is still needed to cut haze. You can't use a yellow filter on the lens because each final exposure will have a yellow bias. That would be too much yellow for the finely colour balanced film to handle. What is needed is a special filter, colourless but with ultra-violet haze cutting properties.

Haze filters are readily available, of course, and coupled with the yellow filter emulsion layer, little or no deadly ultra-violet rays reach the lfim. The irritation removed, the film is able to reproduce images of subjects practically in the natural colours.

Colour negative

There are two basic types of colour films – negative and reversal. The negative film functions in much the same way as a black and white emulsion, except that it is in colour.

Viewing a negative will allow you to see the complementary colours at work. A colour negative, besides having highlights and shadows apparently reversed, the colours are also opposite. The sky will be yellow, red flowers will be cyan and grass will be magenta.

When it is printed, the tones and the colours will revert to normal. For this reason it is difficult to interpret the quality of a colour negative without practice. You can't visualise the transposition of the colours. You have to see the prints.

It is possible to process and print your own colour. But until you have become adept at black and white, you would do well to leave colour alone. Processing the film is similar to developing black and white, but there are more steps. Temperature control is even more important with colour in order to maintain the balance of colours, as well as for the reasons already explained for black and white.

The processing steps are as follow:

1. Colour development.
2. Stop bath.
3. Wash.

4. Bleach bath.
5. Fix.
7. Wash.

You can buy colour processing kits and develop your own colour films if you want to, but it is an expensive process unless you have a lot of films to develop at the same time. These chemicals have an extremely short 'shelf' life. You can't keep them around for long ready to use in bottles. Weigh up the expenses before you buy a kit to 'have a go'. If you have half a dozen films exposed ready for development, and buying a kit will make the job cheaper, why not? Go out and get yourself an outfit.

In making the final prints each of the primary colours has to be treated separately. You balance them all by using filters. The real difficulty arises because you not only have to work out the exposure, but you also have to calculate how much exposure to give through each filter. Each one must be allowed to pass just the right amount of light so that the colours in the final print balance. Incorrect exposure through any one will produce a colour cast.

With such a formidable task, you can see why it is best to leave it until you are much more familiar with darkroom techniques. But let me make it clear. It isn't impossible for amateurs, just difficult. But, like everything else, colour processing and printing becomes easier with practice.

There are a variety of colour printing processes on the market. If you are overwhelmed with a strong desire to indulge, then you should study all of them, and read a couple of good books devoted to that subject only, before you buy. Availability of the materials will make a great difference, on top of everything else. Don't buy yourself into a colour printing outfit which will entail weeks of waiting for replacement materials.

Colour reversal

The second type of colour film produces transparencies or slides. You get the finished product at the end of processing. There is no intermediate negative stage or prints to make.

Reversal film 'geography' is virtually identical to that of negative film. It has the three colour-sensitive layers, plus the

yellow filter layer, and is exposed in exactly the same way. But there the similarity ends. Some types of these films have colour couplers incorporated in the emulsion, and there are those without. The latter have colour literally added by colour couplers in the chemicals. Such films cannot be processed by amateurs. A typical example is Kodachrome.

The films with colour couplers included can be processed by anyone who cares to have a go. Patience is the keyword though, because the process can take hours!

There are slight variations, depending on the system being used, but reversal film processing steps are usually as follows:

1. First development.
2. Stop bath.
3. Second exposure.
4. Colour development.
5. Stop bath.
6. Wash.
7. Bleach bath.
8. Wash.

Some explanations are needed. To begin with, accurate temperature control is vital. Slight variations will totally upset the colour balance, and when that happens you have no second chance. There is no printing stage to put it right.

These chemicals, too, have a short shelf life. Like the negative films, you are recommended to save your films until you have several, and to process them one after another in quick succession.

The first development is really a black and white process. If you fixed and washed the film after this stage, you would get a black and white negative.

Step number three, the second exposure, is when you expose the film to light for the reversal process to take place. All you do is remove the film from the developing tank, leaving it in the spiral, and expose it near a lighted bulb.

So, if you washed and fixed the film at this stage, you would have a set of black and white transparencies. It is when you put it through step four that the colour couplers get into action and produces a colour image.

You can see now that processing colour reversal film is more complicated than processing any other type. Some photographers

find it boring and do not undertake it unless they have to, while others enjoy it. If you think you are one of the latter and are determined to try, then take especial note of the instructions supplied with each packet. If you do nothing else, follow them carefully. It is the only way to get good results.

Colour temperature

Colour films are balanced to react to certain kinds of light. One film will produce beautifully balanced photographs in daylight, yet will turn out results with a heavy orange cast when used indoors under tungsten light. Balance is achieved by colour temperature, which is measured in degrees Kelvin.

To put °K. into perspective, here are some examples of types of light you will use in photography, and their temperatures:

1. Electronic flash	6,000°K.
2. Blue flash bulbs	6,000°K.
3. Daylight	5,000°K.
4. Fluorescent tubes	4,800°K.
5. Photofloods	3,400°K.

You have already experienced using the difference in light temperatures under a variety of circumstances. Think about when you last bought a suit. To make your final choice of cloth, you took it outside to see what it looked like in daylight. But apart from incidents like that where you are consciously aware of the difference, your eyes normally adjust without your realising. Film can't do that.

Colour films, reversal especially, are balanced for a specific temperature. You will find two basic types of reversal film – daylight and tungsten. If you use a film balanced for tungsten lighting (3,400°K.) out of doors in daylight, everything looks as though it has been taken at midnight on the final slides. They will be heavily blue, and dark.

The only time you can break the rule of the right film in the right lighting is when you use correction filters. With the right filter you can shoot in broad daylight on a film which is balanced for tungsten. The filter, in effect, re-balances the light before it reaches the film. There is a considerable light loss, however, whether you are converting a daylight film for tungsten use, or vice versa. The factors on these filters are high.

A wide range of colour correction filters are on the market, and they make it possible to balance any film to match the lighting temperature which is prevailing. But you only need to begin with one or two. Inasmuch as you will normally be using daylight film, your first filter should be one to convert a 6,000°K. film to 3,400°K. Your second filter purchase should be made with the reverse in mind. Any others you need can be added later.

These filters do more than just redress the colour balance. You can make use of them for special effects, too. Carefully selected filters will make the resultant transparency warmer in tone. A misty dockyard scene can be made to appear even moodier by using a filter from the 'cool' end of the scale. It will emphasise the effects.

One point you should remember is that, with the exception of the ultra-violet filter, no filters which you would normally use with black and white photography should be used for colour. The colour correction filters are completely different, no matter how much they may look like their black and white sisters.

Colour and contrast

Another factor about colour films is their much reduced exposure latitude. They just do not have the same scale as monochrome films. With some colour it is a mere one stop either way, making it essential that the exposure is spot on. You must also be very aware of the contrast ratio between the shadows and highlights. To rise above this shortcoming, some photographers will only shoot colour on overcast days, when there are hardly any shadows.

If you give yourself such restriction, there will be very few days when you can shoot colour. In fact it will be impossible for you to get any pictures if you are in places like the Costa Brava, or some other exotic resort. So, you have to fall back on employing other techniques to reduce contrast like using a reflector or a flash gun. You will learn about these techniques later.

These points, which are peculiar to colour, illustrate the necessity of 'seeing' in colour. Apart from the desire to get the balance right, you also need to use the colours in the composition intelligently.

You must be aware of colour contrast and colour harmony to compose with impact. We must now return to primary and com-

plementary colours in order to understand. It is a question of placing two colours together to achieve an effect. Place a primary colour in juxtaposition with its complementary colour and you have colour contrast. An example would be a portrait of a blonde posing in front of a blue background.

Put two primary or complementary colours next to each other and you have colour harmony. For example, a red flower among green foliage, or a redhead posed in front of a blue background. The examples are very basic, but they do indicate how you can create mood and impact. The overall effect can be subdued or emphasised, depending on the strength of the colours, and how they are lit.

The tendency for beginners is to cram as many colours as possible into their pictures. Avoid it. Such photographs do not show an intelligent use of colour. You might even counteract this by going to the other extreme and photographing the subject in almost monochromatic tones. Of course, the subject has to be right for this treatment. A grey building with a grey wall and a grey pavement and road in front of it is the kind of thing. At first it may appear to be a subject for black and white film. But if you shoot it in colour with a belisha beacon top or a coloured door in the composition and see how startling the picture is. Spot colour used in this way in colour films startle and excite the viewer.

Don't be afraid to use plenty of black too. Colour stands out spectacularly against it creating startling impact.

In this chapter you have learned about the fundamentals of colour. In the practical chapters which follow, you will find many more applications which will help you to improve all round. But before progressing further, return to the pages you have so far studied in this book and consolidate the information. Having to stop and check back during a shooting session will be embarrassing and shake your confidence. Get the groundwork right and your photographic technique will progress with a speed that may even cause you to wonder.

Are you ready for the practical work? Right. Grab your camera and let's go!

CHAPTER NINE

When on Holiday

Holidays, it seems, come around more than once a year nowadays. People are taking summer and winter holidays, and jumping into planes to fly off in search of the sun. Nice work if you can get it.

What it also means is, millions of 'fair weather' photographers get to take pictures twice a year instead of once. That is no exaggeration. In many homes, the camera is put into hibernation until holiday time, and perhaps on other special occasions – birthdays, Christmas, weddings etc. In fact, that might even have sounded like your home before you decided to get interested in photography.

Don't protest. Can you honestly say that you carried a camera around with you all the time? Of course not. You probably thought it was only madmen who went out to take pictures at any other time than holidays, anyway..

However, 'fair weather' photographer or budding Cartier Bresson, come holiday time the camera is brought into earnest action. For you, the man who now uses the camera all year round, your holiday is a golden opportunity to act like a professional. You can take pictures at any time of the day – all day if you like. There is no work to do to interfere with your photographic plans. All you have to do is concern yourself with the weather conditions and how to make the most of them.

Most of the pictures churned out during the holiday season are the record type. You have seen them. You may even have taken them in the past. Identical in conception, but for the location (and sometimes that even remains the same), and different clothes you would think they were all taken at the same time. Nearly all of them are snaps of the holidaymakers themselves

who photograph each other in front of some world-renowned landmark. The landmark proving that they were there.

Don't make the mistake thinking that you are above all that. It is so easy to relapse into bad habits. The otherwise competent photographers who think that holidays are the time to abandon all their hard-earned techniques are legion. They seem to think that there is something magical about the holiday air, and that it will turn all their sloppy efforts into stunning pictures. They are usually disappointed. Somehow, the magic fails them.

The truth of the matter is, they are misled. They forget that they are living the experience of the holiday, and it is all fun. They hope their pictures will help them to re-live this fun. To a certain extent, they do. But, our holiday photographers expect these snapshots, which mean so much to them, to set the adrenaline pumping through the veins of their friends and neighbours too. In that they are disappointed – unless they have extremely polite friends and neighbours.

What is worse, as time passes and one holiday is superseded by another, this record means less and less to the photographer.

Don't fall into the holiday trap. Your photography should be just as thoughtful then as it usually is. Not that you shouldn't take record shots. There is no reason why you shouldn't have a book full of them. But they should all obey the rules of good picture creation, and be as exciting as any others you shoot at, any other time.

Be prepared

Before you leave home for your holiday, there is a certain amount of planning that you must do. It should not be rigid. You should leave your plans flexible enough to be able to handle the unexpected, or even to alter your overall scheme to suit circumstances.

Begin by mapping out a plan of action. You know where you are going, and approximately what you are going to do and see. Such planning will provide you with an idea of how much film you will need. Whatever your estimate is though, add a few extra, just in case.

Always take plenty of film. If you are going to foreign 'climes', you may not be able to buy your favourite film brand, or it may be ridiculously expensive. You will know if you have estimated

correctly when you arrive back home with some still in your camera bag. Better too much than too little.

After you have made your plans, then is the time to turn your attention to your equipment. Remember, you will be away from home. If anthing goes wrong, you could be without your camera for the rest of your holiday. Be safe. Check it over yourself first, then, if in any doubt, take it to your dealer.

It is not only your camera in which you should be interested. There is your light meter too. Is it accurate? Just imagine your feelings if all your holiday transparencies were returned from the processing house two stops overexposed. They would be useless. Such things needn't happen.

You may think it a waste of time to get your equipment checked. You may argue that you use the camera all the time and you know that it is working all right. Of course it is. But if there is a malfunction at home, you will lose – what? One film. Two perhaps, before you notice. On holiday, you may shoot for the entire two or three weeks without getting your films processed, not knowing that your shutter wan't working properly, or your light meter was 'under' reading. Even if you shoot one film a day, that will be anything between fourteen and twenty-one films.

As you travel, keep your camera by your side and ready for action. Of course, it will often be inconvenient to take pictures. You may even have to put down your cases or stop the car to shoot. But if you make sure that your camera is always ready, you will experience the minimum delay.

Preparing the camera is good standard 'candid' technique. It means that you can turn a complicated camera into a simple instrument which allows you to 'point and press' at least for the first shot. After that, you can make the adjustments to make sure you get a well exposed and focused shot.

Whenever it is convenient, take frequent light readings. The light doesn't alter that often, unless you move from indoors to outdoors. So even though you may check it for safety, you will probably find that there will be few changes to make to your aperture and speed settings. Each time you take a reading, set your camera. Always use the fastest shutter speed you can in conjunction with the smallest aperture you can. Then all you have to worry about is the focusing.

The photograph of a life-time may break in front of your eyes any second, at the end of your nose, or at infinity. You can't foretell a thing like that. However, you can plan ahead. You know your fast shutter speed will stop most action, and your small aperture will provide a healthy depth of field. All you need now is an all-purpose focus.

The answer, of course, is to use the hyperfocal distance technique. That extra bonus of focus will make it unnecessary to focus for the first shot. If there is time for a second, then you can focus properly. But should things go wrong, and a second shot be impossible, then you can sleep easy that night, knowing that you have one in the bag – or is it the camera?

Besides looking for the incidental shot on your journey, make a record of the trip. It will help you to make the final story more interesting. Much better than a string of isolated shots thrown together for viewing purposes. The trip out and the return journey will give the set of pictures a logical start and finish.

Contrast control

What is your destination? The seaside? Whether it is the Costa del Sol, or Weston-super-Mare, you are likely to experience a problem with which photographers have been battling since time immemorial. That problem is excessive contrast.

Always assuming that you are a sun chaser, you will find it all over the place, but nowhere more prominent than on the beach, or, for winter holiday addicts, in the snow. Either way, you are faced with a white background and a relatively dark subject.

From your studies you know that very few films will be able to cope. You must find some way of reducing the contrast to manageable proportions.

One well tried device which works adequately with portraits and other relatively small subjects, is a reflector. A white towel or a newspaper will do the job effectively. You simply hold it near the shadow side of the subject to reflect the sunlight back into the darker areas. Never use anything coloured if you are shooting with colour film. The reflector will tint the shadows and some of the highlights the same colour.

A flash gun is another useful device for cutting contrast. Chapter Twelve is devoted to flash photography, but a few preliminary notes will help you to get the subject into perspective.

Using a flash gun out of doors to fill in the shadows is a technique known as 'synchro-sun'. To calculate, you merely divide the established aperture number into the flash guide number. This is normally printed on the bulb packet or on the back of an electronic flash gun. The calculation will give you the distance at which the flash gun should be positioned from the subject.

However, there is a factor which needs to be taken into consideration. The light emitted from a flash gun out of doors is not so effective as when it is used indoors. In fact, the flash strength is cut by half. You will have to experiment to find out exactly how your flash performs out of doors first. Do not wait until you get on holiday to do it.

When you have defined the outdoor value of the guide number, do not calculate so that you get a 1:1 lighting ratio. If the light from the flash gun is as strong as the light from the sun, the picture will lack the modelling which comes from shadows. A 2:1 ratio would be fine for colour, but black and white should be at least 4:1. What this means in practice is that the shadows should be one and two stops less, respectively, than the highlights.

One other method which is largely ignored by cameramen to cut contrast is to use a fast film. There is a tendency among photographers to choose a medium or slow speed film when the light is bright. Unfortunately, the slower the film, the greater its inherent contrast. By using the slow speed films you will be exaggerating the problem.

A fast film – of, say, about 400 ASA – has a wide latitude, which has the effect of reducing contrast. The film will cope sufficiently well to provide a reasonable print of black bikinis or tanned bodies on white beaches.

Even fast colour films will handle such subjects better than the slower emulsions. High speed Ektachrome, which you can shoot at 320 ASA provided you tell your processor that you have increased the speed, or Anscochrome 500 would be ideal.

Keeping the background in its place

Despite the fact that a fast film appears to be the panacea for bright sunlight photography, it does tend to have a few drawbacks. The enormous depth of field you will get because you will

be driven to using a small aperture is the main one. It may be all right for a landscape, but it will be disaster for a portrait. The last thing you want in an outdoor portrait is a distracting background. You will be taking a lot of people pictures on holiday, and controlling the background will be your main headache.

The best method is to subdue the detail behind the subject with selective focusing. For that you need a narrow depth of field. With a wide aperture, you focus carefully on the facial features, allowing the background to become a blurred mass.

But a fast film makes the technique difficult to achieve. Its speed may demand settings in bright light of something like f8 at 1/1000 sec! You will be stymied. To be able to focus selectively, you will need an aperture of at least f4.

A filter will solve the problem. With black and white film you can use a 4x yellow or orange filter, and a 4x neutral density filter with colour. The two stop filter factor on each will allow you to use the aperture you need to subdue the background.

Sometimes the background is even more distracting than even selective focusing can handle. Perhaps it contains distracting colours or highlights, and short of moving the subject a quarter of a mile down the road, you are stuck with it.

A change of viewpoint is the only course of action left. Shoot from a high angle of view and you will replace the distracting background with a plain beach, or a low viewpoint will provide a backdrop of the sky. Both are remarkably clear of elements which will detract from the main subject.

With the sky, the depth of field doesn't matter so much, but the beach may require a soft focus effect. If your are able to pick out every grain of sand in the background, you will find this a distracting pastime.

A high or low viewpoint solves some problems, but it can create others. You must watch for them. If you get too close to the subject, your high viewpoint will enlarge your subject's forehead, while a low point of view enlarges his jaw. Neither result is very flattering. Should you be including the entire figure, ensure that you are far enough away to keep the legs in proportion. In short, study your subject through the viewfinder and avoid any distortion.

The formal portrait will be but a part of your 'people' photography. When on holiday, especially on the beach, people let

their hair down in public, and act in a way they would never at home. Here is your opportunity to get some superb, candid action shots. Photograph people running, jumping, throwing, catching, batting, diving, swimming, frolicking, or doing any other 'jinks'.

For this type of photography the shutter speed is all-important. You need a fast one to stop the action. The key is to shoot a likely subject when you see one, even if it is too far away. Keep on shooting, moving closer all the time until you have the subject filling the viewfinder or you are spotted. When the subject sees you, it is too late. The game is up. Suddenly your 'victim' becomes self-conscious, and the antics just aren't the same any more. When that happens, move on.

Accidents will happen

Most beach-bound people are in a gay enough mood that they don't mind being photographed. If they are Great Train Robbers on the run, it is different, of course. But, fortunately, you don't meet them often. Anyway, in ninety-nine cases out of one hundred you won't need protection. But your photographic equipment will all the time. Salt water and sand are your camera's worst enemies. Sand gets into the moving parts and clogs them up, salt water rusts them into immobility.

An ordinary plastic bag will help you to protect your camera from both elements. You can leave it on permanently, even when you are taking pictures. Cut a hole in the side through which you can poke the lens, and clip it down with your lens hood. The bag is pliable enough to allow you to operate all the controls through it.

Always have a filter in place to protect the front element of your lens. If the filter gets scratched by sand it will be cheaper to replace than a lens. Salt water splashes will also hit the filter, not the lens surface.

Nothing will help, short of an underwater housing, if you drop the camera into the sea Prevention, in this case definitely, is one thousand times better than cure. Always wear the camera strap around your neck or wrist so that when you let it go, it will not have far to fall. Should you both fall in there is no answer. If you are accident prone, then I suggest you stay away from the sea altogether when you have your camera with you.

However, if you do drop the camera into the sea, and you manage to retrieve it, place it in a bucket of fresh water and carry them both to the nearest camera dealers. Provided it wasn't the dead sea, or the Great Salt Lake in Utah, the camera might be repairable. But, you can say 'Goodbye' to using the instrument for the remainder of the holiday.

Composing for landscapes

Of course, beach photography will only be a part of your holiday shooting programme. There will be much more to record on film. The town and the countryside for instance. You will probably find yourself shooting more landscapes than you have ever taken in your life before.

This doesn't mean that you do not have any attractive landscapes at home. It is just that they are so familiar that you don't really 'see' them. Anyway, the grass is always greener . . . so they say.

One of the main complaints of the tyro photographer when he tackles landscapes is that his pictures never look like the real thing He is more than likely correct. But what he is really doing is making excuses for his poor quality pictures.

Landscapes can be divided into three categories. There are countryside, seascapes and town shots. All three have their common problems, and all three have their individual peculiarities. Let us begin by looking at the common problems – general points which make good pictures of town, country and sea alike.

To comply with the rules of composition is important. There are those who would say that formal composition is finished. That is not true. A first class photograph or painting still obeys all the rules. It is the interpretations that differ.

Take advanage of the rule of thirds or fifths when positioning the horizon in your land or seascape. Don't forget to make sure it is straight! In the town or city, place the skyscraper a third or fifth of the way in from the edge Position the elements in the picture to create impact, and to make the eye follow lines in the direction you want it to go.

A frame will help you keep the viewer's eyes in the right place. Find a convenient tree with overhanging lower branches forming a natural arch, or an ornate doorway, or any other suitable construction, and place it in the foreground as a frame. It will

'seal off' the scene from the edges of the picture and focus attention on the important part of the subject. The frame need not be all the way around the main subject. In a street scene, for instance, a modern street lamp will do the trick.

If there is no natural frame available, then here is an excuse for using one of your relatives. But please avoid having her looking into the camera with the main scene behind. It confuses the eye. No one knows what they are supposed to be looking at. An example is that picture you shot of your wife standing in front of St Peter's in Rome last year. What is the main subject? St Peter's or your wife? There is confusion because you have included two subjects.

This time position your wife on one side of the composition, perhaps sitting on a wall or gate, looking towards the scene. She could even be walking into it. Now she appears to be a natural part of the scene. Viewers will look to see what she is looking at and get the message.

Apart from leading the eye to the important part of the subject, a frame or foreground interest helps to give the picture an impression of depth. Up to this point you have achieved this only by selective focusing. But in a landscape, you need sharpness throughout. You may even have to use the hyperfocal distance technique to get an extra bonus of sharpness.

The one setback with land- and seascapes is that they tend to be static. They need life injected into them somehow. In a seascape it may mean waiting for a ship or a yacht to sail into sight. In a country scene, you may have to wait for, or 'plant' someone walking down a country lane. The suggestion of such movement makes a great deal of difference

Sky is common to all three categories of 'landscapes'. A blank, white expanse is dull and uninteresting, ruining what would have otherwise been a splendid landscape. A filter will produce sky tone and 'lift' the clouds out of a background of the same colour. However, the degree of contrast between cloud and sky depends on two things: the type of filter, and the nearness of the sun to the area of sky in your photograph.

A favourite filter is a medium yellow filter which separates the two sky tones subtly. If you want contrast, then a much deeper yellow filter is needed. Perhaps even an orange or a cherry red will give you the contrast you want. With these filters the sky

will record almost as black, and the clouds will stand out like pure white fluffs of cotton wool. A very dramatic effect.

Such filters are not needed with colour films of course. The very colour of the sky will provide enough separation. You can deepen the blue, however with a polarising filter.

The second tone density controlling factor is common to both black and white and colour. It is the proximity of the sky area included in the picture, to the sun. The nearer the sun, the lighter the tone or blueness. Bear it in mind when selecting a viewpoint or a time of day for shooting.

You can use filters too, for emphasising the drama or mood of the lighting. Both filters and exposure adjustments will alter the tones, but lighting is the major factor which creates mood. Evening light is warm, reddish in colour, and the long horizontal shadows give an impression of peacefulness and quiet. Morning light is cold and blue. A pale blue filter will enhance the effect of the mist, and make the image 'live' in colour and black and white.

For gloomy shots expose for the highlights and let predominant shadows and dark tones record black. For light and ethereal images, do the opposite and expose for the shadows. The important thing to remember is that it will not work on every scene. The ambient mood has to be right. See it, and interpret it on film. Be creative.

Creative architectural photography

In the town, you will be far more concerned with architectural shots. Avoid the post card type pictures Study the building through the viewfinder to get the best angle. Take plenty of pictures, not only of the entire thing, but also sections of it. Pick out the interesting detail, and make, for yourself, a mosaic of the building.

A fault in beginners' photographs of tall buildings is converging verticals. The building looks as though it is falling over backwards. Sometimes it may be unavoidable because you can't get far enough away without inclining the camera backwards to get the top of the building in.

The trick is, never make it look like an accident. If you must have converging verticals, exaggerate it so much that it appears to be deliberate. Get right in close to the base of the building and

point your camera upwards. Even lean the camera over at an acute angle so the building in the resultant picture shoots up at a dynamic diagonal angle. Some photographers would use a wide angle lens to exaggerate the effect still more.

You will only see such possibilities if you study the subject through your viewfinder. Get out of the habit of walking up to a building and saying 'I like that', lifting your camera to your eye, and 'Bang!', the shot is taken. That is how you did it yesterday. Today is different.

By all means, seek out the landmarks of your holiday town and photograph them. But find some way of doing it differently. Choose an unusual angle, or wait for the lighting to change. Include your relatives too, but make them fit into the composition naturally, as in the landscape described a short while ago. To return to last year's example, don't photograph your wife standing looking at you from the steps of St Peters. Shoot as she is walking up the steps, or in through the doors.

Interiors are also important. Fine cathedrals or other ancient buildings are a must for the holiday photographer. This is where a fast film will score. You have just been outside in the bright sun taking photographs, now you move into a dimly lit interior. With 400 ASA film, it will be a cinch.

Measure the exposure carefully. You may even have to use your tripod if you need a small aperture for depth of field. But all is not lost if you did not bring your tripod with you, the film will still be fast enough to record detail even if it is somewhat limited in depth of field. At least it will be sufficient to make sure that the important details are sharp.

Stained glass windows, a favourite among photographers, are not at all difficult. You simply point the exposure meter cell directly at the window, adjust the camera settings, and shoot. It is as easy as that. There is no mystique. Don't let anyone talk you in to using flash. Let the daylight streaming through the stained patterns do the recording on the film.

Perhaps the interior you are about to shoot is in a theatre, and there is a show in progress. Provided that you have permission from the manager, you can take pictures to your heart's content. The exposure may be a little difficult because you can't get near enough to the stage to measure the light level. However, your meter will give you a fair indication (an extremely accurate

one if you have a spot meter). But, if you are unsure, bracket the exposures, using stops either side of the indicated one.

Colour or monochrome film will do, as long as it is fast. Tungsten sensitive colour film will produce the best results. But your main problem will be the excessive contrast of stage lighting. There is little you can do except rely on the latitude of the film. Just don't try to use a flash. You will already be unpopular enough with the noise of the shutter.

Look for local colour

Search for 'off the beaten track' places which make up the local character. The Blackpool Tower is certainly a landmark, but it doesn't sum up the character of the town. It is the smaller, older buildings in and around the less visited parts of Blackpool which really have character. It might even be a row of guest houses.

When you start reaching out in this direction, you will find no end of local colour which will make a perfect record of your holiday. Washing hanging overhead in the streets of Naples is as much a part of the character of the city as the Eiffel Tower is of Paris.

There are enough subjects and people which tell the story of a town to last a photographer months, even years, let alone a couple of weeks. One Japanese photographer has made his life's work photographing Mount Fuji! Don't ever think you have 'done it all'. If you look hard enough, you will never run out of subjects. Go over the same ground again, and again, if you must. Different things happen in the same street daily.

To get yourself in practice, you might set yourself an assignment. Return to the same street every day for a week. If that isn't possible, make it every Saturday for six weeks, regardless of weather.

Shoot everything – people, buildings, whatever you can see. If it is raining and the street is deserted, you will still find plenty to photograph. The last time you saw it, there were people and cars all over the place. Daytime, night time photograph the street, and make an essay. You will see that each successive day's crop of pictures have turned up something different.

When you understand this principle, then you will begin to grasp the meaning of interpreting the feel of a town and project-

ing character through pictures. You will see that such shots will say a whole lot more than one of a famous landmark. All the landmark does is place the entire event and the place in situ – that is, marking the land. It is what the other shots say that will give your holiday pictures meanings over and above a memory provoking record of a 'fun' two weeks.

CHAPTER TEN

Shoot Action

Many beginners' photographs are devoid of any movement whatsoever. Part of the responsibility is due to the subjects. Whenever they see a camera pointing at them, they freeze and smile into the lens. This is a hangover from the box camera days when it was the done thing to stand to attention to have your photograph taken.

It is also partly the fault of the cameraman. He tends to look for the more static subjects, even to the point of directing someone to stand still. Consequently, the unnaturally static snapshot has become the hallmark of the beginner.

The suggestion of movement breathes life into a picture. Already the odds are against you. Unlike ciné, when you get the finished product, the subject is frozen. All subject movement has been petrified by a fast shutter speed.

Yet you see pictures every day which literally scream action. The photographers seem to penetrate the 'freeze' barrier and produce pictures with subjects which almost leap out at you. The action in the shot is easy to follow. You can practically anticipate what will happen next. It is easy to imagine that you are there, where the action is.

Apart from the visual impact values of a good action shot, there are aesthetic values too. The subject in the photograph no longer appears to be self conscious. Why? Because he is doing something. He is occupied and he is not at all worried about the camera clicking away. Such a picture is lifted out of the snapshot doldrums, and stands among the ranks of the works of serious cameramen.

Shoot plenty of film

As a photographer bent on improving your technique, take advantage of natural movement and capture it in 'mid-stride', so to speak. Action photography is not the most simple aspect of your chosen hobby. There are pit-falls and you will get many failures and disappointments. But there is one standard technique which will bring you sure-fire success. You can say that it is a golden rule. Shoot plenty. Start shooting when the action 'hoves' into view, and don't stop until it is out of sight.

A professional sports photographer would not dream of taking just one shot of a football match action high spot, for instance. It would be more than his job was worth. His picture editor will want to see a selection to be able to pick the best. If the photographer took only one, there would be very little to choose from. Because action is unpredictable and you can never tell what you have until you see the negative, it could be that his one shot, if he should ever allow himself to be so short sighted, is no good. Excessive subject movement could make the picture unprintable. Very similar to his editor's words, in fact.

Don't get fidgety about the cost of film. It is, after all, the least expensive of all your photographic buys. Yet it is the most important, because it is the key to a good photograph. Consider the film a 'lost leader' in the race for the best work.

Shutter speed control is the most important factor in action photography. Not to the exclusion of the aperture mind you. But given the choice of great depth of field, or action stopping shutter speeds and the answer stands out a mile. The aperture must take second place.

Nevertheless, do not make a rod for your own back by choosing a film which is so slow that you are limited in the settings you can use. There are times when you will need a deep depth of field as well as a shutter speed with stopping power. Only a fast film will give you the freedom to do this.

How to suggest movement

If you study the movement of anything, from a child running around the garden, to a racing car high-tailing it around a racing track, you will see it moves at two speeds. There is the main 'body' which is moving forwards at a steady pace. Then there is

the locomotive part – the legs of the child and the wheels of the racing car – which move at a much faster pace. In fact, about twice the speed!

Now this presents you with a problem. Do you freeze everything, or don't you? Take the racing car for instance. Use a fast enough shutter speed to stop everything and you might just as well have taken the photograph while it was standing in the pits. There will be no suggestion of movement.

But, if you set the shutter at a speed fast enough to render the body sharp, yet not fast enough to 'stop' the wheels, then you will get the impression of movement.

What about the child tearing around the garden? Does the same apply? A shot which freezes all motion of a figure leaning forward in a 'petrified' running action suggests all the movement you need. No one in their right mind leans forward to pose like that when standing still. He has to be moving.

With a subject like this though, you have a choice. You can either use a shutter speed fast enough to stop everything and rely on the pose to say it all, or you can slow the shutter down enough to record movement in the extremities. If you do it well enough, it will not look like an accident. The uninitiated will say, 'Oh, what a shame, his arms and legs are blurred', but ignore them. You were after an effect, and if it satisfies you, then that is all that matters.

It is a crazy world we live in. For years cameramen cursed the slowness of films which did not allow them to stop all action. Now that the era of the fast film is here, we find the situation reversed. Photographers now strive to include blur in their compositions. In fact, some modern almost surrealistic action pictures are all blur. There is nothing sharp at all and if you had not read the caption, you might never have known what the subject was.

Taking it to that extreme doesn't suit everybody, but then, modern art forms never do. The photographers of such pictures are delving into the realms of the abstract. However, if it is done well, the picture does say something, even if it is only 'look how fast that went'.

If such pictures set your adrenaline pumping through your veins, then try some for yourself. The technique is simple You set a shutter speed which is too slow for everything.

Controlling subject movement

But to return to the more mundane business of stopping action. The direction of movement in relation to the camera has a bearing on the shutter speed you will have to use. An object coming directly towards or going straight away from the camera does not require much stopping power. If it is moving diagonally across the field of view, even at the same speed, then you will need a faster shutter. Movement at right angles to the camera is the most difficult to stop.

Distance plays its part too. The closer you are to the action, the faster must be your shutter. For instance, to photograph a racing cyclist passing you diagonally at a distance of ten feet, you may require to set a speed of something like 1/1,000 sec. to freeze all action. However, if he were forty feet away, you will be able to stop him with 1/125 sec.

Not all movement needs a fast shutter speed, whatever the distance. Consider the diver on the high board at the swimming baths. He leaps gracefully into the air and falls with a controlled movement into the water.

Just after he left the board there was an instant when all movement ceased. It was only for a fraction of a second and almost undetectable by the human eye. This moment of inertia occurred when the upward movement of the diver was halted by gravity. He slowed to a stop, and when gravity took over he began to fall.

Shoot at that inertia point and you will get away with using a shutter speed as slow as 1/30 sec. Your timing has to be spot on, mind you. But when it is successful you will get some spectacular shots. This is action for the simple camera owners.

It isn't only high divers at the swimming pool, either. There is the pole vaulter, the trampoline artist, and a variety of others.

Follow that car

Consider, once again, the racing car. You have a good, clear position, a few yards from the track and racing cars are passing right across in front of your camera at speed of something like 150 m.p.h. The attraction is their incredible speed. To stop everything but the wheels would destroy that attraction.

Somehow you need to show that the car is moving at 150 m.p.h.

Panning is a well tried technique which allows you to produce all-action shots of fast moving subjects Reset your shutter to 1/50 sec., not forgetting to adjust your aperture accordingly. With the slower shutter, you will be able to set an aperture which will give you plenty of depth of field. Nevertheless, make sure that everything possible is in focus by using the hyperfocal distance technique.

When the car comes into view, pick it up in your viewfinder and move the camera with the car as it careers towards you. Keep it centred in your viewfinder, and when it passes directly in front of you, gently squeeze the shutter release button.

Do not get excited and jab at it, or you will lose the picture through camera shake. Nor must you stop following the car at the point of activating the shutter. Continue to follow it so the camera is still moving in unison with the car when the image is recorded on the film.

The timing must be just right. Wait until the car in right in front of you. Press the button too soon or too late, and a portion of the car may be blurred. For this reason it is necessary to shoot dozens of photographs, even if they seem to be repetitious. Out of the many you take, until you become practised, only a few will be worth keeping.

It is when you see the results that you realise how fascinating the technique is. The car will be sharp but the background will be blurred. The lines of the blur will be horizontal, giving the impression that you and the car were moving at a great speed.

You can even treat relatively slow moving subjects in this way. It makes them look as though they are travelling at fantastic speeds. However, remember that the success of this technique lies in practice, practice and more practice. Start now.

Sports photography

A word or two about sports photography before moving on. It is a highly exacting kind of photography. In the professional field there are very few top class sports cameramen. Yet it has a great

deal to offer photographers on the look-out for exciting pictures. Admittedly, the photographs are practically made for you. But the trick is getting them just right, and there is plenty of room for interpretation.

The formula for a good sports shot is to get to grips with the subject. Get in there with the action. Your pictures should make the viewer feel as though he is participating. Ideally, for this approach, you need a telephoto lens. But do not abandon the idea of taking sports shots if you don't have one. It just means that you have to get closer to the subject with your camera and make selective enlargements later.

There is no substitute for knowing the sport you are photographing. You will be able to anticipate when the action high spots are about to break, poising yourself during the lead up and shooting at precisely the right moment.

If you are a soccer fan, then begin practising sports photography by taking your camera to matches. Have a word with the team manager and he might even allow you to attend practices and training sessions. As he gets to know you, he might even arrange for you to have a 'touchline' position during regular matches. All you have to do is make sure that he and his team get some of your best photographs.

While you are mastering the art of football photography, start looking at other sports. Read books on them. Take to watching the games, and following them on television, and you will soon begin to understand them. As a result, your action photography will improve – fast.

Don't be afraid to offer some of your more spectacular sports shots to the local paper. If the editor likes them, he will buy and publish them. Forget about treating them as 'hot' news items though. The paper will have its own staff photographer there, and he can get his pictures into print before you can. Your pictures will be more suited to feature treatment.

Sometimes action breaks fast and is prolonged. You have kept on shooting and you finish up with a sequence or picture story. These might interest the local paper or magazine, too. In fact they are so popular that it will pay you to deliberately make picture sequences from time to time. They will be exciting additions to your collection at least, and are sure to interest the sporting club or clubs concerned.

You might even make a picture story of your local soccer club, or whatever other sports you are covering. Intimate shots of the players, trainers and Manager will be very welcomed. Put them together to make a special book and present it to the sports club for all the help they have given you. Don't forget to make a copy for yourself too.

Action, action, everywhere . . .

Action photographs aren't all fast moving cars, athletes or soccer stars. They can also include a child playing in the garden, a 'do-it-yourself' expert swinging a hammer, or someone walking down the street. You will be dealing with action in one form or another for almost all of your photographic life.

You must train yourself and your reflexes to deal with the unexpected. The closer you follow the Boy Scout Motto 'Be Prepared', the more likely you are to be successful when the action breaks.

The odds can be weighted in your favour by preparing the camera before-hand. Whenever you have your camera with you – and that should be always – it should be ready for instant use. So, if the flap of its ever-ready case is removable, take it off. If you have to fumble around opening the flap before you can lift the camera to the eye, you will lose valuable seconds. You have to be able to lift and shoot all in one movement, and at the very instant you see the picture possibiliy in front of you. Time and action wait for no man.

Use the standard candid technique to maintain camera readiness. In place of the hyperfocal distance, try prefocusing instead. When you can see the subject moving in a given direction, focus on a spot ahead of it. When it reaches that spot, shoot.

In a way, action includes candid pictures. When you photograph people surreptitiously, you do not have them under your control. Therefore, you must capture them doing what they are doing.

These type of pictures are at their best when the subject is doing something unusual or funny. A bunch of shots of people shopping or children reading are as dull as ditchwater. You must find people being active. Animated people, with lots of movement and facial expressions. People falling off bikes, or arguing and flinging their arms about wildly. That is what candid photography

is all about. Find them and shoot, and the photographs will be among the most popular in your collection.

You will enjoy action photography when you have mastered the technique. As long as you are continually on the alert, and with the solid base of knowledge, you will get some great shots.

CHAPTER ELEVEN

When the Light is Low

The great, mysterious 'available light' no book about photography would be complete without devoting some time to it, mainly because you shoot a great many pictures in it.

The words are generally interpreted to mean anything less than normal lighting conditions. Ardent cameramen explain away their murky shots of clients and artistes in dingy cellar clubs with an airy 'It was available light, you know.' But when you consider the term carefully, you realise that *any* lighting conditions qualify.

However, you must think of it as low light photography. In this chapter you will discover methods of working in difficult lighting conditions. There will often be occasions when you will encounter available light, and it makes all the difference if you are well practised before you have to shoot in earnest.

First of all, what kind of equipment is best suited to this kind of photography? Fast lenses should be at the top of the list. You will have to use the widest aperture possible on some occasions, and it would leave you with much more freedom if you could open up to f1.9 or even f1.2. There is a Canon lens on the market with an f0.95 aperture which simplifies low light photography immensely. But there is no desperate need to have a lens that fast, and you need not despair if your maximum aperture is only f2.8. You will still be able to work in available light, but you will experience some restrictions as you progress.

The second asset to this kind of photography is a fast film.

You will increase your chances of getting good printable shots and the wide latitude will be able to handle the incredible contrast.

The third requirement is an ultra-sensitive light meter. You will need one which will allow you to take a reading from a candle if necessary. Most cadium sulphide meters have a low light booster, which when activated will spark the needle into life practically from the light reflected from cats eyes. Fortunately, you will not be doing that too often.

Shooting in the dark

Without a booster, you may find yourself in difficulties. On many occasions, to get a shot at all, you will have to guess the exposure anyway. But the less you have to do that, the better. Rely on your meter as much as you can.

However, it is always safe to bracket the exposures. Shoot additional photographs of the same scene two or three stops either side of the measured or guessed one. You are after the optimum negative, remember. No trouble taken is too much to achieve that.

Make a note of the exposures you have used. Most well-lit streets or town cafés have similar lighting levels. Once you have established what the best exposure is for one, you can use it as a basis for others with which you come into contact, with remarkable accuracy. But, on each occasion, still bracket your exposures, at least two stops either side, just in case.

This routine is generally applied to night photography, since the higher lighting levels will register on your meter. The trouble is, when faced with the problem of guessing your first exposure, you will not really know where to begin. Here is a chart listing some of the subjects you will encounter at some time on your night shooting expeditions and the kind of exposures you will have to use. These are only starting points. You must make your own experiments to ensure a good negative.

The settings enumerated below are based on the use of a 400 ASA film such as Kodak Tri-X or Ilford HP4, and colour film rated at 320 ASA such as High Speed Ektachrome pushed to twice its normal emulsion speed.

Subject	400 ASA	320 ASA
Artificially Lt home interiors	f2.8 at 1/30	f2 at 1/30
Brightly lit shop interior	f4 at 1/60	f2 8 at 1/60
Floodlit sports fields	f2.8 at 1/60	f2 at 1/60
Neon signs	f5.6 at 1/30	f4 at 1/30
Brightly Lt stage or boxing ring	f5.6 at 1/125	f4 at 1/125
Shop windows	f4 at 1/60	f2.8 at 1/60
Fun fair	f8 at 1/125	f5.6 at 1/125
Bright street lighting	f4 at 1/30	f2.8 at 1/30
Floodlit monuments and buildings (white light)	f2.8 at 1/30	f2 at 1/30
Floodlit monuments and buildings (coloured lights)	f2 at 1/30	f1.4 at 1/30

If the apertures on your camera do not open as wide as some of those mentioned above then you will have to alter the shutter speed instead. Remember, when you close the aperture one stop, then you must decrease the shutter speed by one stop too.

These are not all the conditions you will find in front of your camera, but they will give you a start. If you study the lighting conditions you are about to photograph, then relate them to a similar siuation in the list, you should be able to make a pretty good first guess.

Out and about

Your first night shot will probably be a street scene. Most cameramen start this way simply because it is the first thing they come across. It does not have to be brightly lit to capture the imagination. It can be a single lamp on a corner of a building. The mood and atmosphere retained by such a photograph is worth the effort. There will be a lengthy exposure to contend with and unless you can conjure up 'rigor mortis' you will need a tripod and a cable release.

Street scenes are at their best just after it has been raining. The roads will be wet and the reflections add a new dimension to the picture, injecting new life into it. A study of night street shots taken by the experts will illustrate to you that it is one of the tricks of the trade.

Be prepared to leave your shutter open for long periods of time when shooting street scenes, even though traffic is hurtling up and down In this type of shot a tripod is a must, of course. Set your shutter speed dial to 'B' and press the shutter release. The traffic will 'burn' light trails on the emulsion, creating what has now become an accepted effect on night photographs, but will nevertheless cause appreciative comment.

If, on the other hand you do not want light trails all across your street scene, you will have to pick a much quieter time of night. You cannot stop all the traffic entirely however. The drivers always seem to know when you are picture-taking and deliberately seek you out to drive down your street. You can fool them though, by covering the lens with a piece of black card when you realise they are coming. Stop counting off the exposure seconds while the lens is covered, and only resume when they are out of sight and you can take the card away.

Light trail burning need not be confined to street scenes. They have a variety of other uses. Instead of giving an instantaneous exposure of the big wheel or caterpillar at a fun fair, try a time exposure. The lights on these side shows will burn their own trails, giving a startling impression of movement in what could otherwise be a static shot.

Fireworks too, look good when given this treatment. One, by itself, is a dead loss. You must leave your shutter open long enough for several to blaze their glory trail across the film. The results are spectacular.

You might even try double exposure at both the fun fair and the firework display. Such techniques are highly experimental and you will not have much control over the final result. Each shot will be a new, uncertain adventure. But, be adventuresome. Shoot for the unusual.

Steady lads, steady

In the event that you have neglected to bring your tripod with you, then you will have to use emergency methods of steadying your camera. Prop it on a nearby wall or against the side of a house. Should neither be available, brace the camera by pulling the strap tight across the back of your neck or wrap it around your wrist.

If you are forced to use these emergency methods, a rock steady stance is important. Spread your feet comfortably apart, and in the case of an eye level camera, press it tight against the face. Take up first pressure, gently hold your breath and trip the shutter.

With practice and a steady hand you will be able to build up to taking quite long exposures, sometimes running into seconds. However, they should be used only in emergencies.

Another interesting technique to use when photographing a scene which includes street lamps, is to create a 'star' effect. It is designed to make the points of light from the lamps sparkle, emanating star-like rays. All you need is a fine wire screen or mesh in front of the lens. If you are going to do the trick regularly it is a good idea to fix a piece of mesh into a spare filter mount. You can then use it as a filter, any time you think the effect might pep up the picture But, like all special effects, you should not use them all the time. They will cease to be unusual and eventually become a bore.

Some of the best outdoor night photographs are made at dusk. This is especially the case when the sky is included in the composition. 'Life' in the sky will make a tremendous difference. If you leave it too late in the day to start shooting, the sky will be pitch black and nothing will record.

One important point is that negatives of night shots can be pretty alarming when you see them for the first time. Because there is very little highlight detail, most of the negative will be clear. The highlight detail will be dotted about in the form of

dense portions, so sparsely, you will wonder if the negative is a failure. Watch for that. Don't throw it away. Remember, most of the scene you photographed was in shadow and that means nothing will record on the negative. Only the few pinpoints of light will make their mark.

Available light indoors

Now let us tackle interiors illuminated by artificial and natural light. You might argue that you can add light in the form of flash or flood and make the job easier. Well, you can, but by doing so you will kill the atmosphere. In many shots atmosphere will be all important. In others, where you could use a flash or floodlight, you can bet an aperture to a shutter speed you don't have one with you. Faced with that situation, you either shoot as you are, or get no pictures at all.

The basic problem with indoor available light pictures is the lack of contrast. The low light conditions have already prompted you into using a fast film. The wide latitude inherent in fast films only serves to exaggerate the low contrast.

You could underexpose to build up contrast and overdevelop to compensate. But that step doesn't answer everything. For one thing it reduces emulsion speed at a time when you need it most. In fact you are likely to have to 'push' the speed of the film two, three, or even four times.

Speed pushing is a legitimate procedure which is used by many professionals when in a corner. You can increase the film speed by two stops, provided you also increase the developing time. In this case it would be one hundred per cent at normal dilution. During the longer developing time, the contrast will build up.

With colour some films can be 'pushed' to increased speeds, but it would be prudent to check with your dealers first to see which films you can do it with. For instance it is possible with the Ektachromes. High speed Ektachrome can be used at 320 ASA or even 480 ASA. You must notify your processor what you have done, or, if you are developing the film yourself then you must increase the first development according to instructions

Where contrast is greatest

Inside a room where the illumination is coming from a single

light source, the contrast is greater than most films are able to cope with. The degree of contrast depends entirely on the subject to the light source. A classic example and a useful experiment is a portrait by window light. In this case the light source is the window.

Place your subject near the window and study the effect. The side of the face nearest the window will be well lit, but the shadows on the opposite side of the face will be heavy. Move the subject away from the window, and the contrast will diminish. Admittedly your exposure times will be longer, but that is a small price to pay.

Shoot a picture near the window, and even fast film will have trouble coping. The wide latitude will not be sufficient to record adequate detail in both the highlights and shadows.

Ceiling lighting is the same, only this time, instead of coming from one side, it illuminates from overhead. The shadows will now be under the nose and chin, and in the eye sockets. However, despite these difficulties, you will see excellent photographs taken in both room light and close to the window. How is it done?

Reflectors are the answer. They throw sufficient light back into the shadows to bring the contrast ratio down to manageable proportions. For the window light shot use some white material or a newspaper held close to the shadow side of the face. Not so near that it shows in the final picture, but close enough to fill in and allow detail to record in the shadows.

Reflecting ceiling light is much more difficult. This is especially so inasmuch as you will want to record some activity rather than a portrait. A reflector works but you will probably be working so far away from the subject that you will have to fit it into the composition. That is the difficult task. A white sheet on the floor might help, but it will look grossly out of place. But it would fit in nicely if it were on a bed.

A child down on all fours on a sheet-covered bed reading a comic would appear perfectly natural. The white bed clothes would reflect sufficient light to make the contrast less.

Whichever method you use, choose a room with light-coloured walls in which to take your photographs. You desperately need the reflected light from these walls. Dark colours absorb too much light, making your job even more difficult.

Shooting inside large rooms

To a greater or lesser degree, you will experience variations of these lighting conditions when photographing any interior. Churches for example, are nearly always lit by massive stained glass windows. There are usually enough of them in the building to illuminate the entire room. However the light will probably not be at a sufficiently high level to allow the immense depth of field you need without resorting to a time exposure.

If you want a picture of the stained glass window itself, that is a different matter. You expose for the light passing through the window using the normal method of light reading. It will almost be daylight level. To be sure of getting precisely the right tonal density, bracket the exposure.

You may get the opportunity to photograph a wedding in a church. Fortunately, the flatness of lighting will mean that the contrast between the Bride's dress and the Grooms' suit will be reduced to more realistic proportions. Outside it is different. You will need to undertake a lot of exposure/development juggling to break the contrast down. The easiest technique is to overexpose and underdevelop. It is a complete contrast to photographing inside the church, where you may have to build it up!

Other similar interiors such as museums, art galleries, multi-stores and so on all present similar problems – even lighting with little or no shadow, which spells lack of contrast. Learn to counteract it and you will be successful at photographing anywhere. You will have to learn to contend with mixtures of light. This will not affect monochrome film, but it will play havoc with the colour balance.

The only real criterion is, when in doubt, shoot. An ill-balanced colour transparency is sometimes better than none.

Good available light shots are not easy. You will have to put in a lot of effort to get your techniques just right. Often you will encounter what can only be described as challenges which will require much photographic know-how to succeed. There is no substitute for a good grounding in techniques which you can call to mind when you need them - and use them to turn out top quality pictures, whatever the lighting circumstances.

CHAPTER TWELVE

Flash, Indoors and Out

Flash photography is an accepted part of a cameraman's curriculum in this day and age. At one time it was for the professional or advanced amateur. Not because there was anything really difficult about it, but because the equipment needed was on the expensive side, and bulky to boot.

Of course flash powder started it off. Those heady days when the photographer poured magnesium powder into a small tray and touched it off while his camera shutter was open. A lot of practice was needed to get it right. Too little powder would give you underexposure, whilst too much would burn your eyebrows off.

Now it has been superseded by the less volatile flash bulb. It is easier and quicker to use, but it didn't really gain any great popularity until the household-lamp-sized bulb was shrunk to peanut proportions. The gun itself came down in size too, and the photographer no longer has to carry a shoulder bag about the size of an attaché case.

You can fold these small guns down so small that they can be hung on your camera strap without any appreciable hindrance. The tiny bulbs, sold in packets of five, are inexpensive to buy. Is there any wonder that they caught the photographing public's imagination?

The entire system is based on making sure that the budding flash enthusiast has a low initial outlay. If you have just spent your life's savings on a new camera, this type of equipment will allow you to increase your capabilities with the change that you have left.

Cube flash

An innovation which mushroomed in recent years is cube flash. It makes use of the same type of bulbs fired in normal guns, but four of them are sealed in a clear 'box'. One bulb is on each side, and the cube is designed to fire and rotate so that the next bulb is in position for the next shot immediately.

They originally came into being on the 126 cartridge load camera as a part of the general policy to make photography 'idiot-proof'. Quickly realising their potential, manufacturers soon began to make adaptors to fit flash cubes on the more advanced cameras. They have one distinct advantage – that they are quicker to use than an ordinary gun. You can fire four flash shots with a cube as quickly as you can wind the film.

Consider the steps needed to take two flash shots, one after another, with an ordinary gun. You fire the first shot, remove and dispose of the bulb, replace a new one, wind on the film and fire. Now, with a cube, you fire the first shot, wind on the film (which may or may not rotate the cube); if necessary, rotate the cube by hand, and fire. A much simplified process.

Flash cube adaptors are even less expensive than a standard gun. Because they are nothing more than a rotating platform mounted on an accessory shoe, they take up very little room in your camera bag. Flash cubes can be bought singly – that is a cube of four bulbs – or in threes. A packet of three will give you twelve shots. They cost no more than straightforward flash bulbs, but they are slightly more bulky.

There is not a great deal to choose between the systems in practical use, other than their potential speeds of operation. Unfortunately, flash cubes do not have a professional appearance so they tend to be ignored by equipment-conscious cameramen. However, there is another reason why they have not made inroads into the realms of serious photographers. They arrived on the scene at almost the same time as a major advance in flash gun design, representing yet another step in the long haul to close the gap between the amateur and the professional.

Electronic guns

The miniaturisation of the electronic flash gun was the amateur photographer's dream come true. No longer do they talk of owning any old flash gun – it has to be electronic. The one disadvant-

age is the relatively high initial cost, although electronic flash guns do seem to be getting cheaper with each new model that arrives in the shops.

The price of the gun is far outweighed by its cheapness to run. There are no bulbs to buy because electronic flash guns are fitted with a permanent glass tube which is filled with an inflammable gas. The tube can be used time and time again without replacement.

There is the speed of use too. With no bulb to change or cube to rotate, you can fire, wind on the film while the power recycles then fire again. A small neon tube in the base of the gun will light up when it is ready for the next shot.

Power is supplied by a battery which is either expendable or the accumulator type. Accumulator guns are the most expensive to buy initially, but there are no battery replacements needed in the future. So, this type of gun will only cost you the electricity to recharge it from time to time in running costs.

Both types of guns will operate directly from the mains too, should you be working indoors.

Accumulator flash guns are best suited to those photographers who intend doing a lot of flash photography. They have to be kept constantly charged and if they are left for long periods without being used, internal damage could occur.

An electronic gun powered by expendable batteries is the best for the average amateur. Granted you will have to buy new batteries occasionally, but because the gun will only come in for sporadic use, it is far more realistic. You simply fit in new batteries after the gun has been in long hibernation and it is ready for use. Incidently, if you have one of these types of flash guns, and you are likely to store it away for a long time without using it, take the batteries out first. Many a good and expensive flash gun has been ruined by battery box corrosion.

Another thing in favour of the battery gun is its easy portability. You can find them as small as the standard bulb type which clips on to the accessory shoe and adds very little to the weight or bulk of the camera.

Automatic flash

The designers of electronic flash guns have invented what appears

to be the last thing in automation. A gun which does all the work for you except fire itself. Fitted in the base of the gun, right underneath the flash tube chamber is an electronic eye. When you fire the flash, the light bounces off the subject and back into the electronic eye. The 'eye' then decides when the subject has had sufficient light to make a proper exposure and switches itself off – in mid-flash, if necessary.

It works on the principle of distance. The closer the subject is, the less light it needs, and the quicker the gun will switch itself off. If the subject is some distance away, then of course, the situation is reversed.

The main disadvantages that these computer guns have, compared with standard electronic flash guns, are the initial expense and the inordinately long recycling time. From the moment the flash is fired, to the moment the gun is ready for the second shot, can be as much as fifteen seconds. Not a long time, you say, but when you are waiting it will seem like fifteen hours, especially when the excitement is all happening in front of you. Consider it in relation to a standard flash gun, where the recycling time is only two to five seconds!

Other equipment available includes extra flash heads. You can set them up like studio lighting and take portraits and child photographs. They link together on a special flash cable and fire simultaneously with the shutter. Or, if it is not possible to link extra flash heads to your unit, you might try a slave gun. Like a computer flash, it too has an electronic eye. But a slave gun will not fire independently. It will only react to the flash of the main gun. When it fires, the electronic eye picks up the light, and activates the slave unit.

The advantages of flash photography

The problem facing the tyro is which system to choose. Should you buy bulb, or electronic flash? Of course, the main criterion will be the amount of money you have in your pocket. Inexpensive though some of the electronic guns might be, you get what you pay for.

If you are trying to buy everything at once, with as little cost as possible, you would be well advised to buy the bulb or cube unit to begin with. Get a good electronic gun later, when you have saved up a bit and when you can afford it. At least one of these

cheaper units will give you the opportunity to begin flash photography right away.

But why flash? Why is it needed? Is it to make a photographer independent of the sun? There are, in fact, a number of advantages in using a flash gun, and not all of them serve as a means of making you independent of anything. You will discover that it will supplement the existing lighting as well.

Let's have a look at what flash will do:

1. It boosts the light. Available light photography is desirable if you want to retain atmosphere, but there are times when mood must take second place. If the light level is low and you need a fast shutter speed to stop movement then you will have to use flash. At other times, you may use it for clarity to lift the subject out of the murk.

2. It controls contrast. Remember our difficulty with window light in the last chapter? Too much light on one side of the face and too little on the other. Instead of using a reflector to fill in the shadows, try flash.

3. It increases the potential for depth of field. The light level may not be strong enough to allow a depth of field sufficient to render the entire subject sharp. A flash gun will boost the light to a high enough level to allow a small aperture.

4. It freezes action. When a flash gun is fired, it effectively acts as the shutter. It provides the required level of light for a fraction of a second. Because you have set the aperture for the light of the flash only, nothing will be recorded before and after it reaches its peak. Electronic flash guns have a light duration of some 1/2,000 sec. So, with this action stopping power, you will be able to freeze movement normally too fast for the eye to see.

5. It controls quality. Flash photographs are needle sharp and sparkle with a quality which is distinctive. The short, sharp light at a high intensity delineates the subject in a way no other form of illumination can.

Now that you know why you should use flash to boost the quality and expand your photographic horizons, you need to understand its practical uses. But first, a word of warning. Like any other piece of equipment which is new to you, you should test it thoroughly before taking important pictures with it. Read the instructions carefully so that you will understand its potential. Then put it through its paces.

Is it all that the manufacturer said it was? Was the dealer right in his acclamations of this particular model? More important, as you become more familiar with it, can you use the gun accurately without having to give second thoughts about the technical details? Get to know it well.

Examine yourself

The time and film spent on familiarising yourself with your new flash gun will be worth it, for in future your shots of important subjects will be consistent and successful. Study the method first, then practise your flash photography in private. Work at it until you consider yourself reasonably good, then set yourself a test.

Make it a gruelling one. Give yourself a variety of subjects to take, designed to put the gun and your knowledge rigorously through their paces. If you exercise every possible use of a flash gun you will be able to see from the results where your weaknesses are and strengthen them accordingly.

In practical use, the first thing you encounter is synchronisation. The flash gun must be so co-ordinated with the shutter that the light reaches its highest peak only when the shutter is fully open. There are a number of factors which govern synchronisation. You must consider the type of shutter in your camera and the sort of flash gun you have.

Take the gun first. On your camera you will see a small lever with X and M markings, or two sockets marked in the same way. Your camera instruction book will indicate the exact location. It will also explain about flash synchronisation in relation to your camera. However, you will find that a flash gun synchronises at X whether it is electronic or bulb. The M synch. is for a special delayed action bulb, called class M. The likelihood of your using one of these is so slim though, that having been told about it, you can promptly forget all about M.

When used with cameras which are fitted with a leaf shutter, flash guns of all types will synchronise at all speeds. But a focal plane shutter is a different kettle of fish. Remember, it consists of a blind with a slit which travels across the film plane. Unlike the leaf shutter, only a part of the film is exposed at any one time with focal plane. Electronic flash for instance, with its flash duration of 1/2,000 sec., is much too fast to get a complete

exposure when a focal plane shutter is set at a high speed. The slit just doesn't travel fast enough.

Fortunately, the size of this slit is adjustable. The slower the shutter speed, the wider the slit, and the more of the emulsion is exposed at any one time. What is needed is a shutter speed where all the emulsion is exposed at once. The fastest exposure this occurs is 1/60 sec.

The invention of the copal focal plane shutter brought some improvement. This shutter, because it operates vertically, doesn't have so far to travel, which means that the slit is wide enough to expose all of the emulsion in the frame at faster speeds. In fact, you can synchronise your electronic flash gun with the shutter set at 1/125 sec.

The faster shutter speed eliminates a trouble which occurs with cloth shutters – ghost images. This is a peculiarity which happens as a result of the image recording on the emulsion twice. Once by the light of the flash, and once, much fainter, by the ambient light. It happens because the shutter is open too long.

Check your camera instruction book to see how you should synchronise your flash. It is vital if you are to be successful at this aspect of photography.

Focal plane bulbs are special bulbs with an extra long light peak. The light from the bulb remains bright enough for a time of sufficient length for a narrow focal plane shutter slit to pass over the entire emulsion at high speeds. They are not used in any great numbers by amateur photographers and are not so readily available as the standard type.

Do not let the need for synchronisation put you off using electronic flash on a camera with a focal plane shutter. The two work in combination very well. As long as you are aware of the restrictions, you will have little trouble.

Guide numbers

Unless you have a computer flash gun, you will have to undertake a certain amount of mental arithmetic each time you take a shot. You have to work out the settings to use, based on the distance the flash gun is from the subject.

It is important to realise that the light from a flash gun works in exactly the same way as the light emitted from a torch. The intensity of the illumination is entirely dependent on the proximity

of the light source to the subject. The nearer the two are to each other, the brighter the illumination, and vice versa. The only difference between the torch and the flash gun is that the light from one is continuous, while the other emits it in a short burst.

If you fire a flash gun too close to the subject – at, say three feet – the illumination will be brighter than if it were fired at ten feet. The difference is obviously going to have a marked effect on the exposure of the film. You will have to calculate that difference to find how much adjustment you must make, so that the film will be exposed correctly.

To help you in making this calculation, every packet of flash bulbs and every electronic flash gun is marked with a set of guide numbers. These vary according to the speed of the film.

To work out the aperture setting necessary you simply divide the distance the subject is from the flash gun into the guide number. Remember, you do not need to worry too much about the shutter speed. If your camera is fitted with a focal plane shutter, then the decision has already been made for you. It is either 1/60 or 1/125 sec., depending on the type. If you have a leaf shutter, then the general speed to use is 1/125 sec.

Let's work out an example of calculating with a guide number. You have noted already that the speed of the film you are using will allow a guide number of 80. The distance indicator on your camera says that you are 10 feet from the subject, and your flash gun is perched on the camera accessory shoe. So, for all intents and purposes, camera and flash gun are the same distance from the object of interest. You now divide the distance, 10 feet, into the guide number, 80, and the answer is of course, 8. Therefore, your aperture should be f8.

Conversely, if depth of field is all-important, you will want to establish the aperture first. If you were shooting a portrait, you would obviously want to 'throw' the background out of focus. In this case, you might select f4 as your aperture. Now, divide 4 into 80 and the answer is 20. You must set up the flash gun at a distance of 20 feet.

However, if your camera is fixed to your flash gun you will find it difficult to get a good portrait at 20 feet unless you have a long, long lens. You will have to remove the flash gun from its perch on the camera and take it to the required distance. Remember that it is the light from the gun which governs the

intensity of the illumination, not the proximity of the camera. As long as you realise that the two are, in the majority of cases, separable, you will have much more freedom when using your flash gun.

Unfortunately, you will find that the cable provided with the gun is nowhere near long enough Take the gun 20 feet away, and the cable plug will not reach the coaxial socket. You need an extension cable. These fit into the camera coaxial socket at one end then into the cable attached to the flash gun at the other.

They are available at most camera shops. Fortunately for your pocket, an extension cable is one of the less expensive items. Find the pennies to buy one if you can. It will allow you to become a much more versatile flash photographer.

Flash without tears

There are four basic techniques which cover almost all the situations you will experience where flash may be necessary They are:

1. Direct flash.
2. Bounce flash.
3. Synchro sun.
4. Painting with light.

1. Direct flash. This means pointing the flash gun directly at the subject so that it becomes the primary source of light. You can use the gun on or off the camera, and the calculations are made in a straightforward manner.

Using the flash on the camera does not, however, give the best kind of lighting. It is flat and unattractive with no modelling shadows. Usually the only shadow is a very black outline directly behind the subject if the background is near enough.

For portraiture especially, the gun should be positioned high and to one side of the subject, illuminating the face at the same angle of 45° which you learned about in Chapter Four.

There are times though when you want to retain the atmosphere of the scene in front of you, yet boost the level of light. It can be done with flash if you approach the problem thoughtfully. Take a group of card players, for instance. Lighting for card tables normally comes from overhead. If you flash them from the camera position, you will destroy all atmosphere.

Put the flash gun in the lamp shade swinging overhead though,

and no one but you and the card players will know the difference. Provided you use a light-coloured table cloth, sufficient light will be reflected back into the faces to lighten and put detail into the shadow areas.

When you are stuck with the distance, as in this example, you could lose all control over your aperture, and consequently, the depth of field. The light intensity is obviously too much. A useful method of cutting it down to the required level is to use a plain white handkerchief to cover the bulb or tube chamber. You can even control the intensity still more by the thickness of the light 'filter'. One thickness cuts the intensity down by one stop, two thicknesses by two stops, and so on. There is a point where it is impossible to continue, but only you can find that out by experimenting.

2. Bounce flash. While direct flash does produce sparkling clarity, it is achieved at the price of excessive contrast. Shadows are black and heavy, and highlights may block in if you are the slightest bit out with your calculations. Bounce flash counteracts that.

The term is not meant to indicate that you should move the flash around to reduce the glare in some way. Leave the gun where it is and bounce the light around instead. Light reflected from a flat surface onto the subject produces soft, even lighting with transparent shadows. Altogether more conducive to people pictures.

Bounce flash technique is not difficult. Instead of pointing the flash directly at the subject, you aim it at a nearby flat surface like a ceiling or wall. Calculate the distance from the gun to the bounce surface; then the distance from the bounce surface to the subject. Divide the total into your guide number and you will get the preliminary aperture setting.

It is preliminary because there is one further adjustment to make. When the light falls on an object, a certain percentage is absorbed. Only a part of the total original intensity is reflected. The ratio is dependent upon the object's colour and tone. Darker colours or tones absorb more light than they reflect. So when you calculate your aperture for bounce flash, you must take this into consideration.

A white or light ceiling will reflect most of the light. When you have experimented to perfect the method, you will probably find

that if you open your aperture by a further stop after you have calculated for bounce flash, this will be sufficient. A mid-tone ceiling or wall will demand a further increase of two stops, and a dark surface at least three.

Be careful when using this technique with colour film. If you bounce from a coloured surface, your film will be tinted. Each picture will have a cast the same colour as the bounce surface. You must select a white or neutral tone surface to bounce flash when using colour.

Again, you must experiment and check your own results. Practise enough and you will soon be able to calculate bounce surface/subject distances quite accurately in your head. Ceilings are usually at standard heights. Combined with an intimate knowledge of your film and equipment, delays because of having to resort to mental aritmetic will be minimised.

Incidently, unless you can turn off the computer part of your gun, and use it as a standard electronic flash gun, it will be useless for bounce photography. It will switch itself off when the light is reflected from the bounce surface and insufficient illumination will reach the subject.

3. Synchro sun. A contrast controlling technique used out of doors. The idea is to fill in the harsh shadows cast by 'naked' sunlight.

The principle is easy enough. You will have already measured your exposure, and have a shutter speed and aperture. Make sure that the shutter is set at a speed conducive with flash synchronisation, then divide your aperture number into the guide number in the usual way. The answer will be the distance at which the gun should be placed from the subject.

There is however, a major drawback about shooting flash out of doors. The light from the gun is not so effective as when it is fired inside. Walls and ceilings in a room bounce the light around even when direct flash is used, and boosts the general level. All guide numbers are computed on this basis.

Take the gun outside and fire it, and instead of getting the normal boost, all extraneous light is dissipated into the air. You will find that the intensity may be cut by anything up to one half. You can only find out how your gun works outside by trying it out first. Check the results and see what the differences are. What you have to do is work out a new set of guide numbers for use out of doors.

The advantage of the synchro sun technique is that you can face your subject away from the sun. The shadows will not matter because you will be filling them in with flash. That means much more freedom for both the model and you outside. You are carrying your own 'sun' with you.

4. Painting with light. Cast your mind back to those night shots you took recently. Inside or out, you will notice on some of the shots that certain sections would have been improved if they had some detail. If you had flashed those areas, it would have made all the difference.

During long exposures you can use a flash gun to brighten parts of the subject. Carefully aim the gun at the dark portions of the scene and fire it by hand – while the shutter is open.

This technique is also known as open flash, and the beauty of it is, you can fire the flash gun as many times as you like. It can be in the same area, or different ones. The only danger is that you may appear in the composition too. More than one beautiful Church interior has been spolit by the appearance of the photgrapher in the picture holding his flash gun aloft, like a misplaced Statue of Liberty.

On the other hand, you might just want to get in on the act deliberately. If you do, make a proper job of it and appear more than once. Set up the camera à la time exposure, and appearing at various vantage points within the composition, flash yourself. It is crazy, but it is fun, and it will make your guests sit up and ask 'How did you do that?'

CHAPTER THIRTEEN

Artificial Lighting and Portraiture

Some photographers have a fear of floodlamps and spotlights and the whole concept of indoor lighting. It looks too complicated to them. Consquently, they avoid getting involved and stay in the great outdoors, or use flash.

But they are missing so much. You have absolute control over the illumination and its intensity when you work with tungsten lights. This is totally the reverse position to when you are shooting out of doors. There you are completely at the mercy of the vagaries of the sun. Let the gales blow, let it be past sunset and you can still work with floodlamps and get your pictures.

You will not appreciate the remarkable control you have until you see the first results The sharpness and detail – the pure quality – is so exciting that in a moment of madness you might even consider specialising in portraiture. However, the urge will not stay with you long, and you will soon revert to exploring and perfecting other facets of your chosen hobby

Having extolled the virtues of controlled artificial lighting, it is now time to get down to technical details. Lighting of this sort is generally used for portraiture although you will find it being employed in other work. Still life, table tops, copying, all need artificial lighting. For the purposes of this chapter we will look at portraiture only. Other uses will be dealt with in subsequent chapters.

Film and artificial light

Tungsten light, having a predominance of red, will affect the performance of your film. If you are using colour reversal, then you must either load your camera with a film balanced for

tungsten light, or shoot daylight film through a conversion filter.

Black and white film under artificial light loses some emulsion speed. Not very much, mind you, but sufficient to cause consistent underexposure if you do not compensate. A film of about 125 ASA for instance, is slowed down by one stop and has an effective tungsten emulsion speed of 64 ASA.

However, the higher the emulsion speed, the less adjustment is necessary. This is because the faster films are more sensitive to the red end of the spectrum. Check the leaflet which is packed with your film or the details on the box carefully before you set your exposure meter.

A useful film for portraiture is one in the ASA range of 125, such as Kodak Plus-X or Ilford FP4. The tungsten speed is somewhat less, but it is still fast enough to allow you plenty of freedom. They are fine grained enough to produce more than adequate results, and because you will have control of the lighting, you can ensure that the contrast is well within the latitude of the film.

Choosing your lights

What are you going to need for indoor photography? It does mean that you have to take one more trip to your photographic dealers on another spending spree, but by the time that you are ready to undertake portraiture by tungsten light, you should have replaced some of your savings in the bank.

You will have to consider buying at least two, preferably three floodlights. It is possible to get away with using the special floodlamps only, in ordinary light sockets. However, without the special light reflectors you will lose a considerable amount of intensity. If that is all you can afford for the time being, by all means try it out. It is important that the lack of finances do not prevent you from progressing.

Follow the direction laid out in this chapter for arranging the lights, even if you have to create some sort of 'Heath Robinson' affair to get the lights in the right places.

Should the finances stretch as far as necessary to allow you to buy the lights themselves, you will need two main floodlights for 500 watt bulbs, and a small 275 watt hair light. The latter has a narrow reflector which concentrates the beam from the lamp on to a small area.

These lights are available with a special clip attached to the reflector to allow you to fix them to any chair back, or door, or something similar which is conveniently placed. Alternatively, you can buy them fitted with adjustable stands. Naturally the stands make the positioning of the lights a much simpler ask. You can place them exactly where you want them The clip-on type is not nearly so convenient. If there is no door nearby to get a lamp to the right height, then you have to move everything, lock, stock and barrel to a new position, where there is one.

The next thing is some sort of light control. You could plug all three lights in different sockets, but that is a bit of a nuisance. Every time you want to switch them on or off, you have to race around the room operating switches. If you plug everything into one socket, using a three socket adaptor, you lose control over the lamps individually.

What you really need is a control panel. In its simplest form it is a board fitted with three sockets and switches. You could make it yourself if you are a Do-it-Yourself fan. But, do not mess about with the electrical side if you are not sure of what you are doing. Get an expert to advise you.

On the other hand, there a variety of lamp control units available, ranging from complicated devices which have the appearance of an aircraft control panel, to simple socket switches, almost as described above. Some are fitted with variable dimmers, others allow you to switch to half power. They are designed to give you maximum control over the lights without leaving your camera.

Be sure that you buy a lamp control with the future in mind. It is no good getting an inexpensive model which will only operate three lamps. It may be all right now, but when you become more adept at portraiture you might want to add a spotlight, or even more floods. Look for a control unit into which you can plug six, or even eight lamps if you want to.

The theory of portrait lighting

There is no mystery about handling more than one lamp to illuminate a subject. Just bear one important rule in mind. No matter how many lamps you use, the subject should appear as though only a single light source was used.

Pretend you are working with the sun. There is only one sun.

Therefore, the light comes from only one direction and casts only one set of shadows. We are used to seeing people and things like that. If you see a face with two sets of shadows, it will look unnatural. Make your studio lamps duplicate the effect of sunlight and you are home and dry with this lighting business.

Got the point? Good! Begin by taking one floodlamp to use as your main light. This becomes your private sun. All other lamps you now use must be subsidiaries to the main light. They are used to fill in the shadows, highlight certain sections and to create special effects, but they must not be allowed to take over from the main light and cast their own shadows. Your three lamps will be a main light, a fill-in light and a hair light.

We will look at lighting arrangements in detail later in the chapter. Right now you should gather the remainder of the material you need to set up a home studio. The best way to learn about lighting techniques, is to practise. To see the effects yourself is worth an entire book on the subject.

A studio in your own front room

You will be establishing a portable studio in your lounge or dining room, and you will need a few items from your household furnishings. First, find a backless stool or chair for the sitter. The backless bit is most important. It has a bearing on posture. If the sitter has no chair back to slump against, your pictures will show a much better body line.

The stool should be placed at least three feet in front of an unpatterned background. This can be a plain wall, blanket or a sheet. Any material you use should be without creases or folds. The choice of colour is important too. You can achieve maximum impact by selecting a backdrop which will contrast with the subjects, separating them from the background. Light backgrounds contrast with dark haired people, and to achieve startling colour contrast, use a blue background for a blonde. Continually be on the alert for ways to inject impact and make people look at your portraits.

The minimum of three feet between the background and the subject is necessary for three reasons:

1. It allows you to employ the selective focusing technique to render the background unsharp, and prevent it becoming a distracting element.

2. The shadow of the sitter cast by the main light will fall nearer floor level instead of right behind and will not be visible in the final photograph.
3. It leaves plenty of room between the sitter and the background to move any lamp around for highlighting and other special effects.

You next position the camera. It should be a minimum of five feet from the sitter. Any closer than that and you are certain to cause image distortion. The closer you place the camera to the sitter, the greater will be the foreshortening effect. The nose, forehead and chin become bulbous, and the ears tiny. Not at all flattering.

It must be at the right height too. Generally speaking, the best results are achieved in formal portraiture when the camera is at the eye level of the sitter. Set it too low or too high and you run the risk of distortion once again. However, practice will tell you how far away you must position your camera before you can adjust it to any height without fear of turning your model's face into something it is not.

The ideal portrait situation is to fill the frame. As you are five feet away from the subject, you will have difficulty unless you can use a telephoto lens, or adaptor. A focal length of about 100 mm to 135 mm for 35 mm cameras, or 115 mm to 180 mm for 120/220 cameras is considered about right. Anything shorter than that, and the temptation is great to move in closer. Anything longer and you will have to take your camera outside to shoot through the window to get to get everything in.

Set your camera on a tripod. In portraiture, the camera is positioned on a spot and never moved, other than up and down, until the shooting session is over. If anything has to be shifted at all, it should be the subject.

The reason is twofold. First, when you place the lights, it will be with the camera position in mind. Start moving the camera, and you will throw the whole thing out. Secondly, your background is only limited in size. If you take the camera off to one side, all sorts of unwanted elements creep into the picture behind the subject. Suddenly, your studio will not look like a studio any more. It will look like a front room.

Behind the camera, you are going to need at least two feet to move about, preferably more. This makes a total of ten feet –

the three feet between the background and the sitter, the five feet between the camera and the sitter, and the two feet minimum behind the camera. To provide room for the lights, you will have to clear some three feet each side of the camera/subject line. So start moving the furniture!

First use a dummy . . .

You are now ready to begin. In the early stages while you practise and gain confidence you need a very obliging sitter. Better still, to ease the embarrassment while you get used to a studio set-up, you might try using a bust, or even, if you can get hold of one on loan, a display dummy.

A real person sitting in front of you at first can create a psychological barrier to your getting good shots. You worry about them sitting for long periods of time under hot lights, and the session never goes on as long as you want it to. Which is just as well, because it doesn't seem to be going right anyway.

Use a dummy and your training troubles are over. The realistic features will double very well as a real face. You will be able to create the same lighting effects. Admittedly, the expression is unchanging, but that can be an asset. No real life sitter ever appreciates that like all humans, you too can make a mistake and photograph her with her eyes half closed or right in the middle of saying 'Don't take me like this!'

On top of all these assets, it is fun working with a personality. A bust is unlikely to be of someone who is not well known, and store dummies are usually charicatures of female pop singers. You will enjoy photographing Sandie Shaw or Twiggy.

. . . Then a real person

When you have practised sufficiently to know what you are doing, then find a real, obliging sitter. If she hasn't 'sat' before, she will need a lot of coaxing and relaxing. You will have to show her who is the expert by directing her into poses which you want.

Begin by making sure that she is not facing square-on to the camera. A body facing the camera squarely looks heavy in the final photograph, and totally unflattering to anybody but a rugby player. Have your model sit with her knees facing the main light

and her head turned slightly, so that she is looking right into the lens.

On your request to relax, she may well go to the extreme and go completely limp. Her head will hang back at an unsightly angle creating all kinds of crease patterns on her neck. Ask her to slightly tilt it forward and see the difference.

This is all a part of posture. Models either sit up straight, as if they were on parade, or they slump. You have to help your model find the happy medium – relaxed, but straight. One sure-fire method is to ask her to cross the leg nearest the camera over the other. She will be so busy arranging herself to keep balance, that she will automatically strike the right posture.

Practical portrait lighting

Your long-suffering model, or the dummy, is in position and you are ready to build up the lighting. Start with the main light. That is your sun, remember. Position it so that it shines down on your sitter at an angle of 45°. Now move it to a distance of three or four feet from the subject, halfway between an imaginary line drawn from the subject parallel with the background, and the camera. It should now be at a lateral angle of 45° too.

Finally, move the lamp gently backwards and forwards until the nose shadow on the sitter's face reaches the corner of her mouth. There it should meet the shadow from the far side of the face, and form a triangle of highlight on the cheek farthest from the light.

Now position the second flood close to the camera, at approximately the same level, on either side. When switched on, this lamp should do no more than illuminate the shadows cast by the main light. It must not 'knock them out', nor must it cast shadows of its own. If it does then it should be moved farther from the subject to weaken the intensity of the illumination.

Finally place the hair light high and to one side behind the subject, preferably on the opposite side to the main light. It should highlight the hair only. If the light spills at all, and casts its own shadow, you must move it until the shadows disappear.

The key to successful portraiture lighting is to study the effects of each lamp as you build up the entire arrangement, step by step. Take careful note of what the light from each lamp does and you will save yourself a great deal of remorse in the dark-

room later. Correct any mistakes before you shoot, because after that shutter has fired it is too late.

Once you have achieved the effect you are seeking you can begin to concentrate on exposure. The most important control in portraiture is depth of field. Even though the background may be plain, you still do not want it to be sharp in the picture. So the first thing you do in establishing the exposure is to set the aperture at something like f4, or even f8 if you are using a telephoto lens. Then you can measure the exposure.

Take the meter up to the face to exlude the influence of the background. The meter should be no further away from the face than the diameter of the head. Even if you have a meter built in the camera, the trip is still necessary. This is the only time that you are allowed to remove the camera from the tripod during the shooting session. Make sure that the meter or the camera doesn't cast a shadow and give a false reading. (Of course, if you possess a spot meter, you have it made. You can stay at the camera position to take your reading, provided the acceptance angle of the meter is small enough).

Now all you have to do is to see what shutter speed you should use in conjunction with the aperture you have pre-selected. It should be at least 1/60 sec. to freeze any inadvertent movement from the subject.

If the meter indicates that you must use a shutter speed slower than 1/60 sec. then obviously the general intensity of the illumination is too low. You will have to move the lights closer to the subject until the brightness is sufficiently high. If the meter suggests a speed of 1/500 sec., you can either leave it as it is or move the lamps further away. Increasing the distance may be more desirable because it will probably be very hot under the lamps when they are that close. The sitter will suffer considerable discomfort. Under those circumstances you will certainly not get good, natural looking photographs.

Composition in portraiture

The only thing left to do is to direct the model into a pleasing pose, and shoot. To a certain extent, you can compose in the viewfinder, basing the positioning of the head on the strong points at the thirds or fifths intersections. Compose so that the eyes are placed on or near these strong points. The eyes have the

greatest appeal of any picture of a face. They can make or break a photograph. Rivet attention by asking your model to look right into the lens at the moment of exposure. In the resultant picture she will be peering right out at you. Wherever you move, the eyes will always follow you.

Don't position the head dead centre of the frame. The photograph will be too symmetrical and dull. Place it to one side, and on occasion, include a smaller object like her hand on the other, to balance, using the fulcrum rule.

The best method of learning portrait composition and posing is to study the works of experts. At least it will give you a repertoire and you can sound very authoritative as you direct your sitter into poses. But along the learning way some of it will rub off, and you will soon be developing their ideas, adding your own touches, and creating your own portraiture style.

As you photograph more and more people, you will encounter a number of problem sitters. Not all your models will be film stars. The drawback is, such people generally expect to see themselves in the final photographs looking like film stars. Fortunately, with a little judicious re-positioning of lights and an adjustment to the camera angle you can make the camera lie

Let's have a look at some of the difficulties you will come across in the human face which your sitters will expect you to make disappear.

Turned Eye. Formidable looking to begin with, You can easily counter it by taking a three quarter view of the face. That is halfway between full face and profile. Then request your sitter to turn her eyes only and look into the lens. Favour the turned eye, and voila, the squint will disappear.

Lantern Jaw. Slightly raise the camera above the sitter's eye level and the jaw will be foreshortened to normal looking proportions.

Long Nose. Lower the camera slightly. The foreshortening effect will again come into play and apparently 'shrink' the nose.

Bald Head. Subdue with lighting, and if necessary a lower camera position to de-emphasise. Don't allow the main light to shine directly on the bald head or it will look worse

Prominent Forehead. Lower the camera position. The opposite to the lantern jaw, in fact. An alternative would be to make the sitter lift his head slightly.

Spectacles. While not strictly a detracting feature, glasses will

create havoc with your lighting effects. They pick up and reflect the light right back into the lens. You will need to make only minimal adjustments to the light to get rid of the unwanted highlights, or even a slight turn of the model's head would do. The trouble is, they reappear again just as easily. Watch for this.

But what happens if you are presented with a face which has all of these features glasses correcting a turned eye on a person with a prominent bald head, lantern jaw and big nose! The mind boggles. Where do you start? Don't panic. Stop and study the problem. Decide which are the worst of the features and subdue those. Don't worry if you can't combat all, you can only do your best. Console yourself with the philosophy that you can't win them all.

Psychology and the model

There is one other facet of portraiture, which has nothing to do with technical details, and which you ought to familiarise yourself. It is psychology. You have to establish a rapport between yourself and the model, to put her at ease.

Begin by encouraging a two-way conversation. Ask questions about her interests and get her talking. It is only when she has 'warmed' to you that she will feel relaxed and believe you to be friendly. Direct her in an authoritative manner, but keep it friendly. As long as you can make her believe that you are the expert and you know what you are doing, she will have the confidence in you to relax and feel at ease. Then she will follow your directions unquestioningly. After a while, if you have done your job properly, she will even suggest a few poses herself.

Keep up a constant flow of congratulatory phrases and words like 'That's good', 'Beautiful', 'Hold it like that, that's marvellous' and so on. Make her feel good and give her the impression that she is participating. With this kind of approach, between you both, you will be able to produce a set of portrait pictures which have that professional touch.

CHAPTER FOURTEEN

Photographing the Young Generation

If there were statistics available, it is fairly certain that children would be found to be the most photographed of all subjects. Just about every parent takes pictures of his offspring sometime in his life. Many make some sort of record of the child growing up.

The quality of the work is questionable though. Unfortunately, most parents don't care about quality. As long as that fuzzy white blob in the middle of a fuzzy darker blob is recognisable as their child, they are quite happy. They will croon and fuss about how like little Willie it is, and 'aren't I clever with a camera because this shot came out'.

Parents rely entirely on the child's natural appeal and their own sentimentality to win through. At times, even very competent cameramen fall into the trap and turn out shoddy work. The stupid thing is, when a child is photographed properly and thoughtfully, the results surpass the wildest dreams of the parents.

In a nutshell, photography of children can't fail to be a winner. If you want to escape criticism of your work, turn your attention to photographing the younger generation. Should your wife be your critic, get your own children on film. Her biting comments will soon stop. She will accept much lower standards of work when the subject is that close to heart, even to the extent of forbidding you to throw away your rejects.

The snag is she will begin to demand about forty copies of each photograph to send to the relatives. This catches you between the devil and the deep blue sea. You are not, after all, setting up a printing business. What you can do is teach your wife darkroom technique. Then she can print her own.

Know what to expect

The truth of the matter is, children have a natural appeal which makes it difficult not to get a good photograph. But you must not let emotion blind you to the quality of your work. You must still endeavour to turn out your finest pictures Remember to utilise all the techniques you have so far learned, and add to them an understanding of the psychological make-up of children of various age groups.

Birth to five months. Well, they are just babies, aren't they? Their only concern in life is where the next meal is coming from. You can't expect any reaction when taking photographs, they just lie there. But with a little ingenuity, you will get some good shots.

Five to ten months. They are becoming more and more alert. They are interested in new things in the shape of toys and noises, and will grasp at an old toy as though they had never seen anything like it before. A child in this age group is beginning to sit up, and constantly 'gurgles' at all and sundry. To photograph the five to ten month old, prop him up and attract his attention. You will only manage to hold it for a very short time, so you will have to shoot fast.

Ten to fourteen months. The world revolves around them. They must be the centre of attention. If they can't have their way, they are likely to resort to anything to get it. They will drop their favourite toys if it means that you will come over to pick them up. A child in this age group enjoys tearing paper up, which is a useful ploy to keep his attention long enough to shoot pictures. You will also find yourself inveigled into playing 'Boo!' games because that's what the child wants. Anyway, he will play it back, so there is another opportunity for some good shots

Fourteen to twenty-four months. This child is standing up, albeit by holding on to things to begin with. He likes to feel his feet on something solid, and to test his legs. He also likes to play catch with a ball, and simply adores water, provided that he doesn't have to wash in it. If you do give him water make sure it isn't near any electrical points. You may find that he is a little shy at this age. If he is, ignore him at first until his natural curiosity takes over. Don't try to force him into anything, or he will be notoriously uncooperative. If you can keep him in one spot, you will get some excellent shots.

Two to three years. You can't stop this one talking. He has a lot to catch up on after two years of garbled sounds. He is also asserting himself and testing his 'territory'. There is a great possibility that he may be rebellious. However, his attention can be held by playing childish games or even asking simple riddles. The expressions while he is working them out will make your pictures.

Three to five years. Provided you can hit on the right subjects, he will enjoy talking to you. Keep chatting and press that shutter release like a thing possessed. Let his facial expressions make the results as he expresses delight or disgust over something you said or asked.

Five to ten years. He has become very self-conscious by this time and you may have trouble breaking down the barriers. Self consciousness does have its weaknesses though. Boys and girls in this age group are very much aware of their appearance and looks. Flattery works wonders as an ice breaker.

Formal child portraiture

There are two basic approaches to child photography – formal and candid. Since formal portraiture is fresh in your mind from the last chapter, let's briefly go over the points as they apply to children.

You need the same materials and the same amount of space outlined in Chapter Thirteen. Three feet minimum between the plain background and the 'sitter' position. At least five feet between the sitter and the camera, and some two feet behind the tripod-mounted camera for you to move about. That makes ten feet in all. You will also need some three feet either side of the subject to set up the lighting arrangement.

Three lights will be ideal, but they are adjusted to produce a flatter, more general lighting. Children do not have very pronounced features anyway, so shadow modelling is not so important. Bring the main light around nearer the camera and position, then fill in light where the hair light normally is. It should be farther away, and lower so that it fills in the shadows and illuminates the back of the head, creating maximum separation from the background. Make sure that it does not cast shadows of its own. It should not be so close that it is in competition with the main light.

Finally, shift the hair light over to the other side of the head so that it is the same side as the main light. From its position behind the head, almost identical to the light on the other side, it too highlights and separates.

This lighting arrangement will allow the child to turn in any direction. It will always be effective. When you get active children in front of your camera, those who are still exploring the world, sitting still is far from their minds. You will have to use a faster shutter speed than you would with an adult to catch sudden movemens. Bear this in mind when you are measuring the exposure and adjust the lights accordingly.

If the child is non-talking, resort to appropriate childish noises, embarrassing though it might be. There is no doubt, to be a child photographer of any worth you have to swallow your adult pride and be a clown. Thankfully, older children, those who can talk, require less clowning and more chatter. Ask a lot of questions. They want to talk about important things like what they had for dinner, how much pocket money they get and what they had for Christmas. Develop a stock set of questions which will be of interest to children and shoot while they answer.

Here is a check list of Do's and Don'ts to improve your formal child photography technique and to increase your chances of getting good results.

1. Don't photograph junior until he has had his afternoon nap.
2. Do wait for him to have his bottle or meal.
3. Do make sure Mum stays all the time, to help. You may need it.
4. Do set up the studio before junior arrives.
5. Don't wait until he is in the studio before you switch on the lights.
6. Do take a light reading before he gets there
7. Do ensure that your camera is loaded and ready.
8. Don't go hunting for toys after he arrives. Have them ready for him to start playing right away
9. Don't lose your temper.
10. Do keep shooting, even if junior begins to cry.

The informal child

Many of the best photographs of children are taken while they are at play. When the child is occupied, he is not aware of you

or the camera and his guard is down for longer periods. To make the most of this kind of opportunity you must employ the candid technique.

The art of making yourself invisible to a child needs much practice. The most valuable asset you can have at this kind of work is unlimited patience. Since you are not officially 'there', you can't direct the child. You have to await his pleasure and that will mean an awful lot of waiting.

Much will also depend on your camera handling technique. If your movements tend to be somewhat flamboyant, then you are sure to attract the child's attention. Minimise movements as much as possible.

This is where a waist level viewfinder scores. You need not lift this camera to the eye at all. If you fear being spotted you can even turn away and pretend to be photographing something else, while all the time, the camera is turned sideways with the lens pointing at him. You can also sit on the floor or on a chair, acting nonchalant with your camera in continual readiness sitting on your knee. The only movement you have to make is to press the shutter release button. That is hardly likely to attract his attention.

A waist level viewfinder also has the advantage of allowing you to get down to the child's level. It is easy to lie on the floor and still see the image without getting a crick in your neck. Get down there when you are shooting children. That is where he lives. Your pictures will represent what things look like from a child's point of view and will demand maximum viewer participation.

If a child notices you when you arrive at first, just hang around until his active mind dismisses you as harmless and turns to more important matters like dolly's wash time, or the Battle of the Little Big Horn. When that happens, you become invisible. The only trick then, is to remain that way.

In between times check the settings on your camera. Measure the light level constantly and make any adjustments necessary when there is a lull in the activity. Use the hyperfocal distance technique to enable you to capture action wherever it happens.

When the action does begin, shoot fast, re-focusing as and when time and the situation permits. If you have time and it looks like you are going to get plenty of shots, double check your exposure quickly too. Above all take plenty of pictures. Give

yourself plenty to choose from. If you try to skimp on film, you are lost. Children in action are unpredictable, to say the least, and that about sums up the consistency of your pictures under such circumstances.

Once in a while you may have to capture or occupy the child's attention. Children, being as contrary as they are, look at you when you don't want them to, and ignore you when you want their attention. For the lookers you need something to take their minds off you, and for the independent ones, you need to be able to gain their attention when you want it. Here are a few suggestions on how to do this. Try them, then dream up a few yourself.

1. Give him some sellotape. Not just a roll of it, but a ball with the sticky side out. A young child will spend ages trying to get it unstuck from his fingers.

2. Let him watch T.V. You will capture some marvellous expressions when you photograph children watching television. They live their heroes' part and are very intent when they need to 'will' him out of trouble.

3. Flash him. Fire your flash gun, then photograph him immediately afterwards. The expression of surprise will make the picture.

4. Make strange noises. Young children will seek out the source of any strange noise, but their first expression is one of curiosity. Shoot that.

5. Remove something. Give him something, then take it away. Don't snatch it or he will scream. Remove it gently. Baby will then reach out for it just as you make it back to your camera for the shot.

Make a record

Use a flash gun as a method of stopping the swift movement of children. It does, however, have the disadvantage of making him aware of your presence if you are trying to remain invisible. You will only be able to get widely spaced shots until he gets used to it.

If you stick to photographing your own children, you can, over the years, make a record of them growing up. In years to come you will be able to re-live all today's experiences. So do a job you will be as proud of then, as you are now. Find different and interesting ways of making the record. A straightforward photo album can be pretty tame stuff You will find unusual presenta-

tion methods outlined in Chapter 17, but in the meantime make your pictures tell stories. Gather these visual tales together to make up a single page in your album, or even a double page spread. Study magazines and copy the layout.

You might even look for opportunities to make sequences. Here the story is told, not in one picture, but in several. It all adds interest.

Don't stop at photographing your own children. Extend your activities to others in your neighbourhood. You could even try a photographic exercise in your local school. Ask permission to picture the pupils at work and offer a set of the best to the school, free. Shoot the children at work and at play. Try to capture their every mood. You will, of course, stick out like a sore thumb in a classroom. The pupils will watch you intently. But if you sit around and wait them out, they will soon lose interest in you. Then you can begin shooting.

Go any place where children conglomerate. You will find them in the parks, the swimming pools, sweet shops – anywhere. You will only get the best child pictures by going and looking for them. They won't come to you. So, off you go. Good hunting!

CHAPTER FIFTEEN

Feathers, Fur and Film

Photographs of members of the animal kingdom are second only to children in appeal. They elicit 'Ooh's' and 'Aah's' whenever they are shown. Pet owners are just as oblivious to the quality of the pictures of their animals as parents are with snaps of their children. If the picture is recognisable, that is all they care about.

As to the popularity of such photographs, it can be put on a par with the furore that arises every time a national newspaper tells the story of an animal that will be put to sleep if a home can't be found within a few days. The editor is generally inundated with requests. There is no doubt that people love animals.

You can cash in on such sentiment, and be just as successful as a photographer of animals as you can with children. No one except fellow photographers will criticise the quality of the pictures. The ordinary viewer of your work will let sentiment blind him. He will judge it on the appeal rather than its technical merits. However, as with pictures of children, do not let animal photography make you lazy. You still have to satisfy yourself, and you should always aim to produce the best work.

You do not have to have special equipment to photograph animals. Any camera can be used. It is the technique which may differ in some ways, that is all. So don't let the formidable array of cameras and equipment owned by professional photographers of the animal kingdom put you off. You can do a perfectly adequate job with what you have.

The approach is, in fact, very similar to the photographing of children. You can either take pictures of animals formally or informally. They react, in some ways, just like young children, so

you will need to bring all your long-suffering patience into play. They can be just as uncooperative, and even unfriendly. You will often find yourself left with an empty space where a dog once was, silently cursing, but forcing a smile through clenched teeth, and with perspiration running down your face. But, it's fun!

Use exactly the same studio set-up described in the last chapter. There are the same difficulties to contend with. The animal certainly will not sit still to pose for you and may well suddenly turn his head at any time. The three light arrangement will ensure a well illuminated shot wherever the animal is looking

Again, keep the setting simple. This applies whether you are photographing the animal in the studio or in the kitchen. Watch out for distracting elements in the background. It only serves to attract the eye away from the main subject in the final picture, no matter how well subdued.

When to shoot

Think about what you are doing when you are getting a pet ready for a shooting session. They are simple-minded and work on an association of ideas system to establish criteria. For instance, you will naturally want your dear Fido looking his best for the photograph. You may even give his coat the second brushing it has ever had in the dog's life. The first was the day after you had him. Not being used to it, he is likely to get irritated, and as a result, will become uncontrollable. What is worse, if you stick him in front of the lights immediately after his unwelcome grooming, he will associate the unpleasantness with photography. At that point you might as well give in. So groom him sometime before, and let the effects wear off before you subject him to studio lights.

Your pet will also be a poor subject if it is mealtime. He is hungry, and food is all that he is concerned about. If you must have a photographic session then, wait until he has been fed. He may be sleepy afterwards, but at least he will be receptive. The best time of all is in between meals. This also applies if it is 'walkies' time. If he is taken out regularly, you will get no sense out of him until he has had his run.

He has been looking forward to this all day. He may even have been saving himself for the supreme pleasure of this half hour. There is no way you can get away with delaying it, or even

shooting during the moments leading to it. The excitement is too great.

Yet, after the walk he is too exhausted. All he wants to do is wet his tongue and collapse in front of the fireplace. Sleep is foremost on his mind. The moral is, choose another time to take photographs.

There is an unfortunate quirk about human nature that rises to a peak when there is an opportunity to laugh at their favourite things. People actually get a laugh out of indignity. You have seen it. You may even have laughed yourself. Fair enough, we are all susceptible to this kind of thing, but try hard not to succumb to compounding the felony yourself.

I am talking about dressing animals up to look like humans. If you have any respect for your pets at all, you will not debase them in this way. They have their dignity, and you have no right to take it away. If a pet owner asks you to photograph his animal this way, refuse and point out how animals illustrate their senses of humour in vastly different ways.

You will have to attract the attention of the pet to get the right expression. Most of the methods you learned for children are of little use for the family pet. He is rarely interested in dolls, for instance, unless it is your dog's favourite toy. But even then, there are so many strange things going on around him that he is unlikely to take any notice of an old doll.

You will have to resort to making strange noises. But be careful what noises you use. A sharp hiss for example, will cause a dog to prick his ears up and look inquisitive. But, it will send a cat scuttling to an inaccessible corner under the bed. Use a warbling whistle or a squeaky toy, or a metal 'cricket', or some other harmless sounding gadget will otherwise do the trick. The unfortunate thing is they soon get used to the noise. You will have to change it often. When you set up your studio, make sure that you have a variety of noise-making gadgets to hand.

To attract a cat's attention you might use a piece of paper attached to a length of string. Flick it out of the way the instant before you shoot. The quizzical expression will make the shot. The business of suddenly removing the 'bait' just before shooting works with a number of animals Members of the reptile family are a good case in point. Dangle an insect in front of a lizard and wait for him to get lined up for the 'kill'. Whip it away and

shoot. It will be some time before the lizard realises that it has gone, and you will get some shots of a very alert looking animal.

Exploit natural beauty

It is essential to accentuate the animal's characteristics. There is something about one breed which makes it different from all the others. This is not from an individual point of view, although that exists as well, but in relation to type Perhaps you have no idea about animal characteristics. If you want to make a good job of photographing these creatures, then you should check up on breed characteristics before you shoot. If the animal isn't yours, ask the owner to point them out.

Take a Siamese cat for example. It has a characteristically long head, with a Roman nose. The head, from the front view is triangular in shape. It has oriental eyes, and if you are shooting in colour you will want to take special care to make sure the blue is clearly seen. Finally, you should also take note of its long body.

All of these things should be noted and effort must be made to emphasise them in the final photograph. They are what makes a Siamese cat different from any other.

An important point about cats and any other furry animal is the coat texture. It is not easy to show the fine hair clearly in the photograph, and the key to doing so lies first in focusing, and secondly in exposure. Expose for the shadows and give full development, and you will get all the detail you want

You might also try to catch the animal in a characteristic pose. To refer back to the Siamese, he is a very regal looking cat. Show him like this in your pictures. It isn't too difficult. These cats have a permanent 'off with his head' expression. Even when a Siamese cat is just sitting, he looks regal all the time. The only problem is getting him to sit still They tend to be very restless But if you are photographing a show cat, then you have it made. He will be very obedient and sit for ages.

A pointer points, a bloodhound sniffs, a tortoise eats and a rabbit hops – get them on film being themselves. Never mind the pretty-pretty poses, with the animal looking dolefully into the lens with the intent of breaking someone's heart. Everyone does that. You be different!

Should you want to extract maximum emotion from people who look at your pictures, put the two most appealing subjects

together – animals and children. It shouldn't be allowed really, because the magnificent quality of your picture recedes into the background. Instead of getting comments like 'Isn't that a good picture?', all you hear is 'Oh! Aren't they lovely?'.

However, a small child holding a puppy or a kitten is a sure-fire winner. Don't be afraid to use it to your advantage. When shooting, you do have twice the problem in front of your camera. You will need all the patience you can muster, trying to control a child and an animal. It is mind bending, so think carefully before you become involved, and make sure that you are ready for it!

The list of Do's and Don'ts listed in the last chapter are just as applicable to animal photography. It is just as essential to be absolutely ready for your 'sitter' so that he will not be too frightened. It is upheaval enough without being suddenly blinded by intense lights just after you enter a strangely 'furnished' room.

Birds and fish

There are two more pets which need formal lighting, and which are often ignored by photographers. They are cage birds and fish.

The difficulty of photographing a cage bird, such as a canary or budgerigar, is how to obscure the cage. The bars generally prevent you from getting a good picture. You can hide some of them by placing some white paper to form a background around the back of the cage. Press the camera lens right to the cage bars in the front and hope that the bird does not come over to see what that new glassy eye is. The bars will then be so out of focus that they won't show up. It is a useful trick which will work with any thin wire mesh, wire bars and so on.

Illuminate the bird from above and from the camera position. To prevent the bars casting shadows put a piece of tissue paper on top of the cage to diffuse the light, and fix a diffuser on the other one.

You will be so close that the depth of field will be considerably narrowed. The more light you can get into the cage without cooking the bird, the smaller the aperture you can use. Extend the depth of field even further by using the hyperfocal distance and then wait for the bird to enter the sharp area. Once he gets used to all the strange lights and your big head so close to the cage he will hop around quite naturally and continue to wreck his carefully cleaned and tidied (for the occasion) cage.

Fish do not present any real difficulty as far as lighting is concerned. In fact if you treat them as water-borne birds, you will have no trouble. Position the lights exactly as you did for the budgie cage. Your only problem will be the reflections in the glass However, these can be eliminated by a careful adjustment of the camera position or by using a polarising filter.

With birds or fish, flash will work as well as floods. True, you cannot see the effect as clearly, but experience will tell you where to place the guns.

Even when you are photographing animals in general, flash will help you to freeze the movement. They tend to move very fast, and you need the flash speed to catch them in 'mid-stride'. Contrary to popular belief, a flash firing does not disturb the animals at all. It may momentarily surprise them, but it will not damage their eyes. It also has the advantage of not being too hot for your pet to sit under, and is small enough not to frighten it.

Whether you are using flash or available light to photograph household pets informally, and in their normal habitat, get down on the floor where they are. Like children, their world is down there It is only natural that you should try to make your camera see things from their point of view.

Occasionally you can try a few unusual angles, but they should be exceptions rather than the rule. Care should be taken about choice of viewpoint because it can add meaning to the picture. A high camera angle for instance, depicts isolation, while shooting from a low angle will emphasise strength. You could go to extremes, and photograph something like a kitten from directly underneath, with it standing on a sheet of glass.

Wild animals

You do not have to go on an African safari to get photographs of wild animals. This country is naturally full of them in one form or another. Fortunately, we are not a home for the more dangerous kind. However, the upsurge of safari parks sporting free-roaming animals, heretofore seen only in films and zoos, means that you can photograph animals foreign to our shores in what appears to be their natural surroundings.

Provided that your car windows are clean, you will be able to get many interesting shots. A telephoto lens is a must for good

composition, but if you do not have one, be prepared to make some giant, selective enlargements. Don't shoot while the car is moving. Camera shake is hard enough to avoid without adding car movement to it. There are places for cars to stop. Use them.

In effect, the car doubles as a hide. Photographers of birds (the feathered kind) use 'hides' to remain unnoticed. A real one consists of a screen with a hole through which the lens pokes. With a 'hide' and a long telephoto lens you will be able to photograph indigenous wild animals and birds without attracting their attention.

In some ways zoo animals are easier to photograph, if only because they are usually confined to a small area. The trouble is, the bars get in the way. Unless you can press your camera lens right against or in between them it will be obvious that your picture has been taken in a zoo.

It is as important to find out the characteristics of a wild animal and show it in a photograph, as it is with a pet. You may have to wait a long time for it to strike just the right pose since they do not take kindly to directions from anyone except their keepers. But, if it is good animal pictures you are after, you have no choice.

Use all the tricks you learned in the chapter on action photography for getting shots of fast moving animals. Pre-focusing, panning, and so on are the techniques you can use here too. The effect is just as startling and will give your pictures that 'all-action' appearance.

As repetitious as it is beginning to sound, shoot plenty of pictures. Animals are so unpredictable that you cannot be sure of having secured the best shot until you see the finished results. Play it safe and your best animal shots, formal and informal, will be among the most spectacular in your collection.

CHAPTER SIXTEEN

Copying and Close-Ups

The technique of working closer to your subject than normal is a useful addition to your photographic repertoire. Sometime in the future, your are bound to want to undertake some copying and close-up photography.

There may be a picture in an old magazine that you like, or a wall painting, or even a photograph of your great-great-grandfather which your aunt will not let you keep. You simply copy and return it. Your aunt is happy, and so are you.

Professional copy photographers use special equipment. They have large cameras with double extension bellows, mounted on a special stand which looks as though it would support a tank. But the likes of you and I have to make do with our general purpose equipment.

Actually, an ordinary camera does the job perfectly well. As long as it is steady and you fill the frame with the subject you will get a good reproduction. Much does depend on the film you load. This is one case where a fast film will not be suitable. You need to find a much slower film to take advantage of the grain. There is a special copying film called Process, which is extremely slow and has practically no grain. But it is also highly contrasty and colour blind. It functions best when used to copy a monochromatic line drawing, or something similar where contrast is needed and colour interpretation doesn't matter.

For multicoloured subjects, a slow panchromatic film will reproduce a faithful range of tones. It too has such fine grain that it is practically non-existent. However, while the contrast is high, it is capable of turning out sharp, crisp reproductions well within

the contrast range of enlarging papers, without any loss of the original tones.

Setting up the camera

You can copy originals either horizontally or vertically. The picture or diagram is pinned to the wall, or it lies on a copying table. Most of the time it will be a matter of preference, but there are occasions when the decision will be forced on you.

Whichever method you decide to adopt as your own, you must use a tripod. Get into the habit of fixing it to your camera every time you do some picture-taking indoors The least amount of camera shake will show up in the final print, especially as you are working with close-up equipment. All your careful work will have been wasted. Anyway, you will find that many of your exposures will be long ones You can't hand hold a camera for ten seconds, can you?

Remember to use a cable release too, and if you own a single lens reflex camera, release the mirror before you shoot. Lock it up if your camera has that provision, then fire the shutter. There will be even less chance of camera vibration if the mirror doesn't have to flip up out of the way of the film just as the shutter opens.

Lighting and exposure

Lighting is an important part of the copying procedure. You are going to need your photoflood lamps. Because the subject is only two dimensional, you will only need two lamps. These are placed equidistant from the subject, one on each side of the camera, so that the illumination is evenly distributed. If there is some imbalance in the lighting, it is because one lamp is slightly further away from the subject than the other. However slight, the uneven lighting will show in the finished photograph

The trouble is you may not be able to see it before the shot. You could check with your light meter, measuring first one side of the subject, and then the other. But a far more simple method is to use a piece of card, placing one edge of it on the centre of the original and holding it upright so that the two are at right angles to one another. The card will cast two shadows, one on each side. If one is longer or darker than the other, then the lamps aren't

positioned correctly. Adjust them until the shadows cast by the card are identical.

When you are satisfied that the light balance is right, then you can measure the exposure. It goes without saying that you must take the meter close to the subject to make sure that the acceptance angle of the cell does not include the surroundings and register a false reading. Watch that it doesn't cast a shadow too. A light meter is sensitive enough to pick up even the slightest variation in light.

However, unless you have utmost faith in your meter, bracket the exposures every time This will make sure that the exposure is full enough to faithfully translate the original colours into black and white.

Filters also have a part to play in copying. They are generally used for corrective measures with the purpose of eliminating reflections, or blemishes, or enhancing contrast. A simple example of the need to improve contrast is illustrated when you see the results of an unfiltered photographic copy of a blueprint Instead of the background being an even tone, the blue paper is blotchy with an uneven tone varying from white to a little more than medium grey. As you can imagine, the diagram will not show up well.

Shoot it again, only this time with a red filter on the lens and you will see a vast improvement in the result. The paper background will be an even black. The contrast will be very much improved and the diagram will stand out as though it were illuminated.

But, you are not likely to have to take many copies of blueprints unless you are in training to become an industrial spy. It is more likely that you will have to contend with a photograph or drawing which has been marred by having something spilt on it. If, for instance, the damage has been caused by a coloured ink or paint, it should be transparent and you can use a filter of the same colour to eliminate it. Green ink will disappear when photographed through a green filter – at least in the copy.

Filters will also help you to maintain maximum control in the reproduction of the tones in the original. You are in fact applying the principle mentioned in the last paragraph, but this time in relation to a coloured picture. Remember the principle that a filter will lighten a tone of the same colour, and darken a tone of

the complementary colour. This means you can adjust the translation of the colours in, for example, an oil painting, if you so desire. By controlling the tones in this way you can effect quite startling changes and emphasise or de-emphasise any part of the original.

Tricks of the trade

At times the orginal may need some special treatment to enable you to make a good copy. For instance, a very old photograph may have been damaged. You know how easy it is for a picture to get creased and dog-eared. The emulsion cracks and you are faced with white lines right across the middle of great-great-uncle's face.

To eliminate the white lines, begin by mounting the original on a card to keep it flat. Copy it as it is, attempting to get the second picture as near to the original tones as possible. If you are allowed to retouch the original, you can use the copy as a guide to blend the spotting fluid to match the tones. On the other hand, if the original is sacrosanct, you can retouch the copy. The final stage is to copy the retouched photograph. Your resultant picture will be an unblemished great-great-uncle.

Sometime you may have to make a copy of a picture which has been originally printed on textured paper. If you photograph it as it is, the copy will show the texture too and the final print will be far from clear. You can eliminate the texture by placing the original in a dish of shallow water. It suddenly becomes invisible. Shoot your copy through the water and then dry the original. The texture will return in the first picture, of course, but it will not show at all in the copy.

A newspaper picture may cause you problems too because of the 'dots'. Look at a picture in any newspaper through a magnifying glass. You will discover that the dark areas appear to be made up of white dots, and the light areas of black dots. This is caused by the screens through which newspaper photographs are printed.

Unfortunately, when you copy one of these pictures, the dots suddenly become very prominent. The only thing that you can do is to throw them slightly out of focus. Then they will disappear. The trouble is the entire picture will by slightly off focus too, but that is something you will have to put up with

If a painting is covered with glass you will have to shoot through it if you want to make a copy. Your main problem will be reflections. In many cases a slight adjustment of the lights or camera position will eliminate them. However, if you bought a polarizing filter to photograph your fish or darken the sky in colour landscapes, you can use it here, too

Copying colour transparencies

There is one other type of copying which you are likely to encounter. It is vastly different from anything you have so far undertaken, because of the very nature of the original Colour transparencies must be viewed by transmitted light, so you can't lay them on a flat surface to make copies, or pin them to a wall.

The two methods used for copying colour transparencies are photographing them as they are projected on a screen, or through a special copying device If you have a projector, the former is obviously the least expensive, because you do not have to buy any additional equipment. It is an easy method, too. You simply project the original slide onto the screen, measure the exposure in the normal way and shoot. You can make sure that you get good colour saturation by bracketing the exposures a stop each way.

The basic drawback with this method is that you cannot photograph the projected slide square on. If you try to, you will get in the way of the projector. Of course, you could try to use back projection (taking the photograph from the rear of the screen), but not every photographer has a screen suitable for this. You should also note that it is possible that the texture of the screen will show in the copy.

Special copying devices for colour transparencies fit right on the camera body or lens. The slide clips in the holder at the end and you copy it by transmitted light. You simply operate the camera in the normal way as if you were taking an ordinary photograph. A through-the-lens metering system will make exposure much more scientific, otherwise you will have to rely on charts and experience. a flash gun as a light source will help you keep the exposure at a reasonable level and balance the light.

Colour temperature is something you should watch out for when copying on colour film. It may take more than a tungsten balanced film to get the colours right, especially if you are using

the slide projection method. It is more than likely that you will have to employ a colour temperature filter.

Close-up devices are a must for copying of all kinds. If you are using bellows or extension rings, remember to adjust for the light loss The actual exposure through these accessories might be two or three stops more than indicated by your meter. Do you recall the formula for working out the true exposure?

$$\text{Equivalent f value} = \frac{\text{Aperture in use} \times \text{Distance from lens to film}}{\text{Lens focal length}}$$

Full details are given in Chapter Two if you want to refresh your memory.

Close-up lenses need no such compensatory action, but if you are using them on a rangefinder camera, watch out for parallax. You will either have to guess the difference in the field of view between the viewfinder and the lens, and make the necessary alteration, or use a wire frame.

You can make a wire frame yourself. All you need is a piece of wire bent to the shape of your camera's format and slightly larger than the size of the picture it will take at a specified distance. An 'arm' leading from the camera case retaining screw socket will hold the frame in position. Fix it in position so that the frame surrounds the subject showing you approximately what the lens sees.

Table top and still life photography

You will find a variety of subjects for close-up photography besides copying. Normal, everyday objects look different somehow when they are magnified beyond their ordinary size. As an exercise, wander around your house looking for subjects. What would those sticks of celery look like in close-up? Or what about that bunch of keys, they would make an unusual abstract. You will find plenty of subjects if you study everything through your viewfinder.

Then, of course, there are table tops. This is the art of making toys look real, or turning an ornament into a 'living being' on film. Ordinary table salt becomes snow, oven liner doubles as sky, bits of string are shipping hawsers, and cardboard – well – there are so many things you can make with cardboard. Create your own tableaux in miniature The horizons of your table top

world are as wide as your ingenuity and creativity will let them be.

Similar to table top in the approach, is still life. Both require careful set-ups, thoughtful lighting and the creative touch. A bowl of fruit or a vase of flowers are fair game. You will find yourself shooting so close that the flowers or fruit become mere patterns. But abstract is not the only type of photographs you will get from still life pictures. Take a trip down to your local art gallery and see what a range they have there. All famous artists at some time produced a still life. Why should you be any different? A complete flower, or a part of it – you can create your own masterpiece.

People generally do not photograph well through close-up devices. Abandon any ideas you have of trying to get a good portrait using these accessories. You may get away with photographing babies this way because they have hardly any features anyway. However, it is still advisable to take a three quarters view or a profile.

Otherwise the field is unlimited. From household pets to insects, all are subjects to the close-up cameraman's eagle eye.

Depth of field will be your biggest bug-bear in table top and still life photography. Simple things like flowers will not be in focus from the front of the petals to the back of the stem You will have to stop down considerably for all-through sharpness. Unlike copying flat originals, where depth of field was not so important, you are now shooting three dimensional subjects.

You may have already lost some control if you are working with bellows or rings The exposure compensation you have had to make will have decreased the effective speed of your emulsion by two stops. To get the depth of field you require, you will almost certainly have to resort to a time exposure, unless the subject is mobile. In which case you will have to use a faster shutter speed your depth of field suffers once again.

Added to this, the proximity of the lens to the subject magnifies movement considerably. Even the slightest camera shake will be recorded. Therefore you will have to use a tripod. The steadier the camera the better.

Exposure of small objects require special attention. The minute size of the subject will mean that the background is bound to influence the final reading. The only way to overcome this is to measure the exposure from an object of a similar tone or colour,

in the same light, but bigger. Give a full exposure to ensure plenty of detail in the shadow areas. They are more important in close-up pictures. You are quite prepared to dismiss the fact that there is little or no detail in a photograph of an object which only fills a small part of the whole. But when the entire picture is taken up with the subject, then shadow detail becomes very important. You can't dismiss that so easily.

You can always boost the illumination with flash or flood. Apart from filling in the shadows, it will give the necessary boost to the light level for that desperately needed extra depth of field.

There is a whole new world awaiting you through a close-up device. Study your subjects through the viewfinder, photograph them, and enjoy them. The results will make exciting additions to your collection of photographs and look even more startling, larger than life, in full colour, projected on a screen.

CHAPTER SEVENTEEN

Showing Off

A very import and final stage in the production of a photograph, is the presentation. It is the one thing many amateur cameraman seem to ignore. Yet, while it is necessary to obtain an optimum exposure, careful development and meticulous printing, the public are impressed or disappointed by the way in which you show off the results.

Pictures can be enhanced by presentation. No matter how good your slides are, for instance, if they are screened in a haphazard fashion, your viewers will soon become bored. Make a story out of the set of slides, however, and you will have them eating out of your hand. They may even ask to see more!

The usual method of storing your photographs so they can be seen easily is in an album. But how do you do it? Have a look at your book now. Your pictures are probably stuck in the pages with no attempt to put them in any order. They are just a bunch of isolated photographs.

You can do better than that. Study pictorial magazines, especially pages where there is a spread of photographs Notice that they aren't all the same size, and see how they are arranged according to their importance. The photograph with the most value is placed on the top right-hand side of the page. Look at how the big pictures are used for impact, while the smaller ones, only slightly less important, are used to 'fill in' and give balance.

Compare it with your own book. Then try laying your album out like a magazine picture spread. Make photographs of different sizes to suit the layout Begin by studying a photo spread which catches your eye and transferring that new found knowledge to your own album.

Mark up the pages before you print the pictures. No magazine

art department will be ruled by the size and format of the original photographs. They will lay the pages out knowing that the appearance as a whole is as important as the pictures themselves. The artist will first sketch the page layout, working in the number of pictures which will best suit the design. Then he draws his sketched design to the proper scale.

You can do this too. Your sketch should be in proportion to the actual pages. Don't make the sketched pages square if your album is oblong. When you have a design which you like, then draw a full size diagram. Measure the pages carefully so you have the actual size. Finally, print the photographs to be entered in the pages, concentrating only on the formats needed to conform with the design. You must ignore standard paper sizes if necessary.

Don't be afraid to use judicious 'white spacing'. It adds to the overall appearance. Too many photographs crammed on to a single page will detract from the design. Keep the number down and leave plenty of space between them.

Now and again, when you have a photograph which warrants it, make one to fill a whole page. It will add impact and will do what it is supposed to – stop the viewer and make him utter approving noises.

Make every picture tell a story

The pictures themselves should have something to say If it is a single photograph, it should stand on its own. Even though the 'story' is obvious in a picture, it should not prevent you from adding captions. They can add interest and be as long and explanatory as you like. But that does tend to hold up the flow. Better that they be a few words, linking one shot to the next. Page titles can also be added to group otherwise isolated photographs together under a common theme.

If you have an extra special picture story to tell, why not give it a book all to itself. It need only be a few pages, but it will be an interesting variation. All you do is mount the pictures on pieces of card, bearing in mind lay-out practice, and link the pages together. You can do it with clip rings especially made for this kind of thing. They are available in most stationers. Don't forget to title the book and add captions as and when necessary.

Mounting photographs is a process which you can undertake in

one of two different ways on a variety of different materials. The simplest, most inexpensive mounting material is rubber cement. Available in tubes or jars, you spread the rubber cement evenly over the reverse side of the photograph and place it in position on whatever you are mounting it on. Press the picture down with a lintless cloth, then cover the whole lot with a piece of card and put a weight on top. You should give the picture overall even pressure.

Rubber cement is useful for mounting pictures on card, wood or a variety of other surfaces. Wooden mounts are especially attractive when done properly. The thickness of the wood is a matter of taste, but a piece with black or wood-grained edges and a varnished photograph completely covering the front surface will look different hanging on the wall, or free-standing on top of the television set. Round the corners of the photo and mount for even greater effect.

The other method, which is often used for exhibition prints, is mounting tissue. You literally iron the photograph on. The tissue, a translucent material, is put between the mounting board and the photograph. Tack one corner to the print with the point of the iron to keep it in place, then, with a metal sheet covering the entire photograph, run the iron over the surface. What happens is the mounting tissue melts under the hot iron and forms a tacky surface. When it dries, the photograph and the mount are bonded together.

Display your prints

Various unusual displays are possible using either of these techniques. For example you can make an ever-changing display on a sheet of pegboard fixed on the wall. Mount a set of at least 10 in. by 8 in. pictures on sturdy card and put them on the board, keeping them in position with pegs. Lay them out as you would a page in your album and when you get tired of them, simply change the photographs for another set.

Or, you might mount several smaller pictures on cards and tape them together. Make a 'concertina' out of them. You can then stand them freely on top of any flat surface A number of pictures on a given theme under a sheet of glass on a dressing table or an occasional table will give you a surface with a difference.

There are any number of variations. The thing to do is look around the home and see how pieces of furniture can be enhanced by photographs. Then look for unusual ways of showing how good your work is.

Under the theme of presentation must come greetings cards. Christmas is the most likely season to send you scuttling into the darkroom to churn out hundreds of photographs of the family for friends and relations. Well, instead of rummaging through your old negatives this year, take some especially with a Christmas flavour.

Make your own cards, too, using specially designed folders readily available from a number of sources. A quick browse through the classified ads of any photographic journal will place several companies which sell them.

But don't just stop at Christmas. A photograph of the new offspring will go down well instead of the usual baby announcement card, for instance. There are plenty of opportunities for making use of this 'art'. You can let your imagination run wild because the more bizarre the design, the more interesting will be the card. Start thinking about it now.

Colour at its best

The presentation of your colour transparencies will suffer from the fact that they are all, more or less, the same size. You can't do too much about it. So you have to make up for it in some other ways.

An additional problem is that they have to be projected on to a screen. It can be irritating to have to darken the room and set up the projector and the screen. You will see the look of resignation cross your guests' faces, if they don't emit groans of agony, when you mention that they ought to see your latest slides. it is at that moment that you realise that you must find some way to brighten the presentation up if you are to stay popular.

To begin with, what sort of show do you want to present? 'Show?' you say, 'All I want to do is project my slides!' All right. But supposing you went to the cinema and all they did was project a couple of reels of film which bore no relation to one another. You would be bored to tears. You might not even go again.

Certainly, a film is different to transparencies, but the presentation isn't. An evening in the cinema is supposed to be entertain-

ing, and so should an evening with your slides. A series of isolated shots is only of interest to those who are closely involved If you make your slides tell a story – well – all the world loves a story.

Link your transparencies in some way. Create a theme and give it a beginning, middle and end. It may be the story of your holiday, or the first five years of baby's life. Whatever the theme, as long as you make it interesting, you will hold the interest of your 'audience'.

Despite the fact that a movie is a highly visual story-telling device, nowadays, the tale is partially carried along with dialogue and music. To duplicate this you will have to write a script. If you have a tape recorder, you can commit your script and some background music to tape and play it when you next show your slides. Without a recorder, you will have to read the script out each time.

When writing the script, avoid phrases like 'This is a slide of . . .'. Your story should flow naturally with the slide punctuating and highlighting interesting points. Look at this example:

Slide	Dialogue	Music
David laughing	As baby David's birthday came around again the excitement rose to fever pitch.	'Happy Birthday to you' phrase on trombone.
David searching in cupboards.	. . . what was he going to get?	mix to 'Sorcerer's Apprentice'.
David looking under a cushion	Mummy has hidden it somewhere. She always does.	Continue with Sorcerer's Apprentice
David moving bookcase.	No commentary.	Continue with Sorcerer's Apprentice.
David looking fed up. and so on.	She had beaten him. It just couldn't be found.	No music.

There is no need to draw the attention of your audience to the fact that they are looking at a slide. They already know. But they want to fool themselves and lose themselves in a world you are creating for them. That is why they and you enjoy the cinema so much. You escape from reality.

The art of showmanship

You can add a real professional touch by including title slides. Special titling letters are available, or you can use 'Letraset'. Find brightly coloured backgrounds for the slides and use close-up lenses or extension devices to make the letters nice and big. Don't worry about depth of field, even with the so-called three-dimensional title letters. You are, practically, working in two dimensions so sharpness throughout will not be difficult.

Remember the trappings. At the cinema it is all-important. The dimming lights, the curtains, the incidental music – all a part of your entertainment. With a little ingenuity your performance can have similar embellishments. Have a special place in the room for the screen. If you can find some way of leaving it there as a permanent feature, so much the better. Look for some way of disguising it when it is not in use.

A light dimmer is not expensive, and together with the soft, incidental music, creates the right atmosphere. Your guests will get into the right frame of mind before the first slide appears on the screen.

Be well prepared. Have everything ready before your guests arrive. Take a tip from the cinema managers. They don't wait until the patrons are in their seats before hunting about for and setting up the projector and screen.

Competitions and publications

Soon you will want to expand your horizons and show your pictures to more people than just your family and friends. This strong desire will demand that you show the whole world what a clever chap you are. There are two outlets for you to let off photographic steam – competitions and the press.

Competitions are a lot of fun. Admittedly, you are competing with a great number of other photographers, all of whom are submitting pictures on the same subject. But you stand as much chance of winning as anyone else, provided that you are turning

out good pictures. At the very least, competitions are useful assignment setters for you, so take advantage of every opportunity which comes your way. With a variety of specific assignments to fill, you will soon get good all-round experience.

Enter every competition you can. Don't fall into the trap of promising yourself that you will enter and finally letting the date pass without sending in anything. Your rationale suddenly becomes 'Well I wouldn't have won anyway'. If you have thoughts like that, you will fall into the ranks of the other aspirant seven out of ten competition entrants who never win, and who are of the same mind.

There is one final point which is important about entering competitions. Before you submit anything, you should read the rules. Don't laugh! It may sound like a stupid statement, but there are so many entrants who do not. Their entries, although excellent in every other way, are disqualified because they did not conform to the rules. So, be warned.

Most of the comments made about entering competitions hold good for selling to a publication. The difference is, you will not be one among many with photographs of the same subject. Even if it is a one-subject magazine, like those catering for hobbies, the fact that it exists means that it has a voracious appetite for good pictures.

Feature pictures are your best bet. These are subjects away from the 'hot' news, and more of a timeless appeal. They don't have to be published now, or die.

There are certain categories which are sure-fire winners for magazines and competitions. They:

1. expose the tragic,
2. reveal the spectacular,
3. explore the emotional,
4. display the beautiful,
5. lay bare the humorous,
6. present the dramatic,
7. capture the unexpected, or
8. parade the famous.

If your picture fits into one of these categories and the magazine it is aimed for accepts the subject matter, then you stand a good chance of success.

Market study

Understanding potential markets is something else to which you must devote some time. You should be an avid reader of magazines, not just for the interest, but to study the kind of photographs they need. Look carefully at the published pictures and ask yourself questions about them. 'What category do they fit into?' 'What makes them interesting to the type of readership of the magazine?' 'How do these photographs differ from those published in other magazines?', and so on. Get to know the editor's requirements and start setting yourself assignments on subjects suitable for the market you are studying. Eventually, you will break into print.

It means developing a commercial mind and applying it to your picture taking. Just about every photograph you shoot should have some saleable potential. Nor every one that comes out of the back of your camera will be of saleable value. In fact, very few will be. But if you concentrate on producing commercial orientated pictures, the ratio of marketable shots will increase.

You could link up with a writer, or indeed, write some articles yourself. An article accompanied by some first class photographs will stand a better chance of being accepted than a picture on its own. In this case, it is even more important that you know your market well. The article will not get a first reading if it does not conform to editorial policy. So don't waste your time on a writer who does not know his trade.

Submitting pictures for publication and competitions is a precise operation. Editors and judges like big pictures. Submitting an enprint is a total waste of time and effort. It won't even be considered, unless, of course, the competition rules say it is all right. That is a good case for reading them properly. Nevertheless, you should endeavour to send in the largest print the competition will allow.

For publication, your best bet would be to standardise on 10 in. x 8 in. Magazine editors like that size. It should be single weight and glossy and clearly marked with your name and address. Buy a number of folders and file your photographs by subjects, ready for sale at any time you spot an opportunity.

Keep a record of all the photographs in your file with any data relevant to the picture. Subject, f stop, speed, film type, developer, and so on. Anything which will help you make an

identical picture to restock your files when you have just sold one.

You should also keep a record of all your submissions and sales so that you know where all your photographs are, and where, when and for how much each one has sold. For your information, you can sell a single photograph several times over. You do not have to throw the negative away once it has been published. A really good photograph will appeal to many editors, and it is only fair that they all should have the opportunity to have a go at publishing it. It also fills your pocket.

However you should not be unethical and send the same photograph to several editors at once unless you know that they only want them for their files.

When sending pictures in to magazines, you should make sure that all the details they want are on the reverse side. They must not be written directly on the photograph, especially in ball point pen. The pressure causes the writing to show through on to the front of the picture, making it useless. Type or write the details on a piece of paper and tack it on the back of the print with rubber cement or Cow Gum.

Submitting colour

Place your photographs in a hard-backed envelope or in an ordinary one with carboard inside, together with a stamped, self-addressed envelope. Transparencies should be sent in the same way, but you should avoid packing them in glass fronted mounts. The glass is almost certain to shatter in transit and could well scratch the transparency beyond salvation.

Editors do not like colour photographs. Submit only transparencies if you want to stick to colour. To keep your files straight, you may want to get a duplicate made of each slide, even though, unlike black and white photographs, transparencies are returned at times, whether a self-addressed envelope is included or not.

There is no need to send an explanatory letter with your pictures. They should describe themselves You can send a courteous cover note if you like, but it should say no more than something to the effect that you are pleased to submit a selection of photographs or transparencies for possible publication. No more than that Even that is superfluous. The editor is fully aware of your reasons for sending him the photographs

One important factor about finances. You should always declare any sales on your tax return forms. To cover up the fact is an offence. However, you can declare expenses too. Capital and running costs are legitimate claims. Your camera, enlarger, paper, developer, envelopes, and so on are expenses for which you are entitled to relief. Once you begin selling photographs, you are in the category of a freelance professional. Make sure the tax office is aware of that.

Right, get cracking. You can realise a return on your investment in no time when you start selling your work. But on top of that, there is the thrill of seeing your work in 'print'. You will get excited every time you see a magazine in which your photographs are published. it is a feeling which never leaves you, no matter how many times you sell your pictures to magazines. I still experience it every time, and it is one you should not deny yourself. Sell, and see.

Epilogue

You have made it. You are ready to unleash your newly developed talent on an unsuspecting world It is a grand feeling, and I wish you every success. But, where do you go from here? Well, to begin with, keep on shooting. Mix with other photographers and listen to what they have to say about their hobby You will learn a lot that way. Perhaps you might consider joining a club. That will give you a chance to mix and learn You will be able to enter club competitions and receive valuable advice on how to improve.

The only trouble is, some clubs are a little old fashioned, and you will not progress at all in one of these. Look at the club carefully before you pay your annual subscription. Is it your kind of style? Is it up to date? Does the programme for the year appear to be suitably varied and interesting? Is the standard of work good? These questions, and many more, must be answered satisfactorily If the club than passes all your tests, by all means join it.

There is, however, a particular species of club photographer who you should avoid like the plague. He is bent on destruction. Whilst willingly sharing his knowledge and giving you the benefit of his vast experience, he will suddenly turn on you and tear your work to shreds.

He loves to criticise No one really knows why. Perhaps he is frightened that you will catch up and be better than he is. Whatever the reason, he is no company for you. Stay away from him He will destroy your fervour as sure as eggs. When you meet him first, as you assuredly will, and he unleashes his vitriolic tirade on you, don't let it get you down. Remember that you have

heard of him, and that he does it to everyone - even the club's best. It puts you in good company.

Constructive criticism is another matter. You can thrive on that and learn from it. Seek it out continually from those in a position to know what's what about a photograph. Then digest it like a good meal.

You can benefit from the professionals, the real 'greats' of photography by becoming a follower of their work. Study them, until you can recognise their work instantly. Some of their exceptional methods will rub off, and you will be zooming up to their category.

Read modern photographic magazines. They will give you plenty of information about shooting pictures as well as acquainting you with modern trends. Turn to books on the subject too. Don't stop at this one. Read as many as you can.

Granted, you will benefit by reading this book several times, but expand in other directions as well. Other photographers have different approaches to the subject and you would do well to learn and try them out. You may find that you want to make a hybrid of several techniques from photographers and produce one which is, in effect, all your own.

If there is one final thought I would like to leave with you, it is 'Continually strive to produce your best work in the most original form'. Make photography your medium, with your mark stamped all over your every shot. Master it, and enjoy it and it will serve you well for the rest of your life.

Good hunting, and success to you.

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